Draft FY 2002-2004 Columbia Plateau Province Work Plan

Prepared for the
Northwest Power Planning Council

by the
Columbia Basin Fish and Wildlife Authority

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Introduction

The "rolling" provincial review process was developed by the Northwest Power Planning Council (NWPPC) in February 2000 in response to recommendations by the Independent Scientific Review Panel (ISRP) and the Columbia Basin Fish and Wildlife Authority (CBFWA). Under this new province based process each individual project proposal within a province will be reviewed for technical merit and management relevance every three years. Under the previous process all project proposals for Bonneville Power Administration (BPA) funding under the Fish and Wildlife Program were reviewed annually. The purpose of the NWPPC's new multi-year process is to reduce the burden of reviewing large numbers of proposals, most of which had been reviewed just one year before, and to provide for a more thorough review of the project proposals in the context of a subbasin summary. Additionally, the process is intended to provide the opportunity for site visits by reviewers, project presentations with a question and answer period, and provide reviewers with more detailed background and planning documents which will reduce the reviewer's reliance strictly on the proposal form.

The subbasin summaries developed under this process are intended to be interim and will be replaced by subbasin plans developed to meet requirements of the recently amended Fish and Wildlife Program. The Columbia Plateau Province was the fourth province to be reviewed under this new process. The results of this review are summarized here.

This document was developed collaboratively by the NWPPC staff, ISRP, fish and wildlife managers, other stakeholders, and CBFWA staff, culminating in project and budget recommendations for FY 2002-2004. The subbasin summaries are provided only as context for the project recommendations.

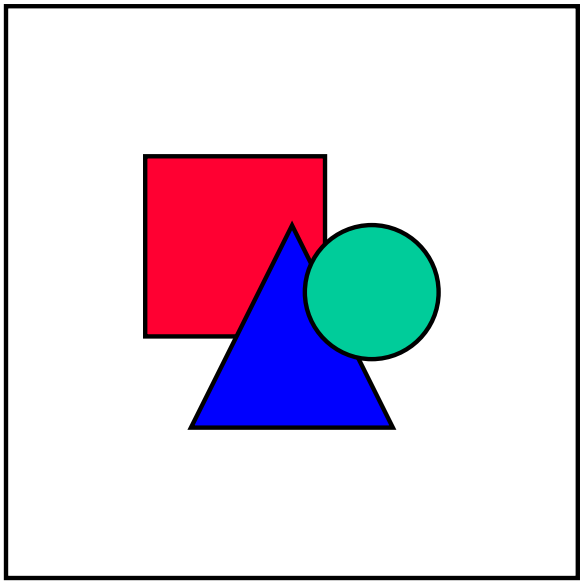
The CBFWA process for providing these recommendations utilized the ISRP preliminary findings and integrated manager evaluations of the technical and management merits of the project proposals relative to anadromous fish, resident fish and wildlife management needs, and the goals and objectives identified in the subbasin summaries. A total of 166 project proposals were submitted and reviewed with 9 proposals (i.e., 25037, 25041, 25044, 25061, 25076, 25087, 25098, 25099, and 25100) receiving a "Do Not Fund" recommendation. The recommended projects address needs identified in the subbasin summaries and include 80 new and 61 ongoing projects totaling $55 million. In addition, 16 proposals (11 new and 5 ongoing) totaling $26 million were identified by the CBFWA as proposals that could potentially be implemented as "High Priority" projects pending crediting resolution with BPA and NWPPC. The CBFWA will formally request a policy level meeting to resolve this issue.

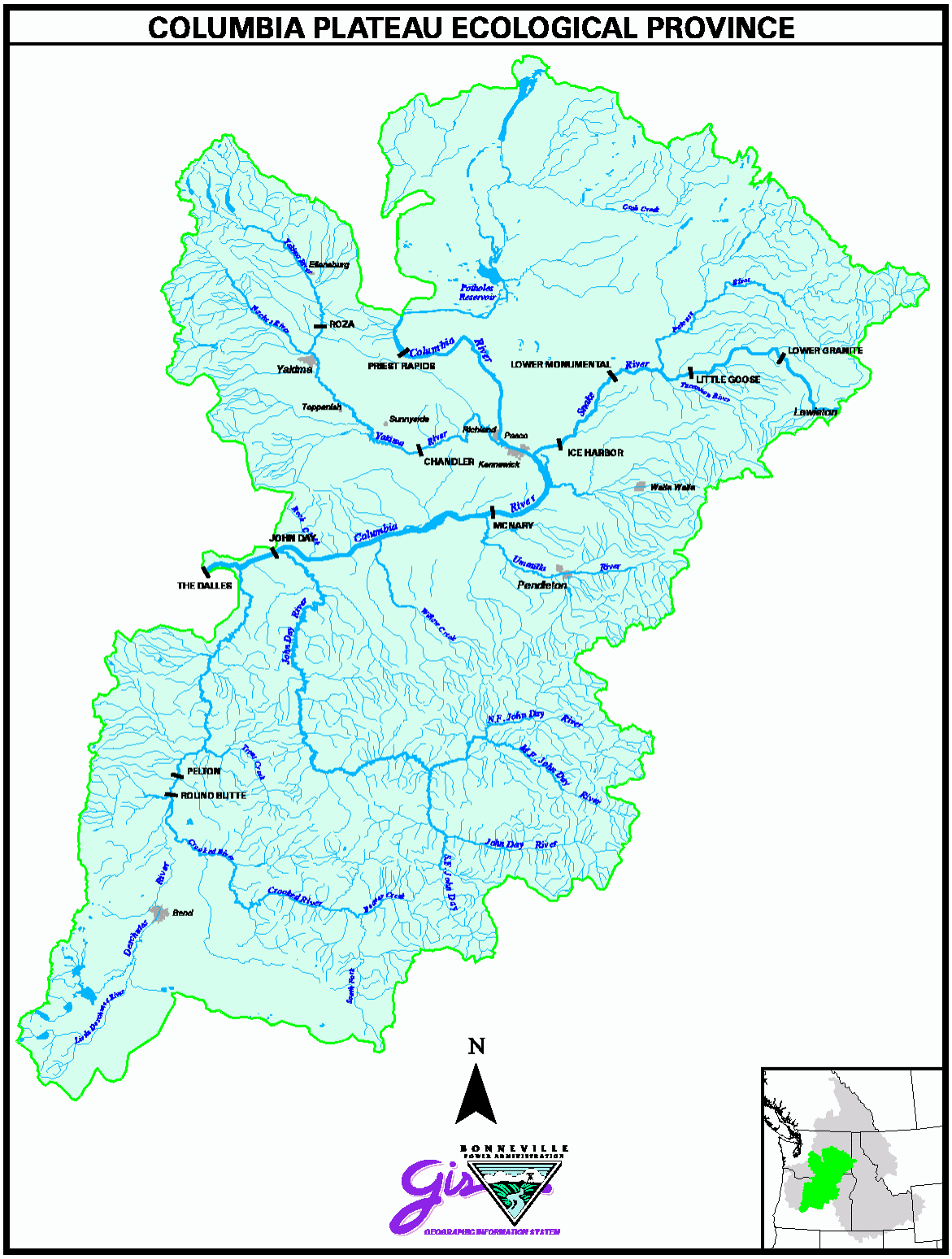
Besides crediting resolution, there is concern over inconsistency in BPA's use of in-lieu funding as the basis for denying funding of some proposals and an urgent need for the BPA to provide the region with a working definition of in-lieu. The CBFWA will be forwarding, to the BPA and NWPPC under separate cover, a request for a policy level meeting to address the crediting and in-lieu issues.

This draft work plan includes the subbasin summaries, which describe the physical and biological characteristics of each subbasin within the Columbia Plateau Province. The summaries also identify past accomplishments, limiting factors, management objectives and strategies, current needs and recommended budgets for project implementation.

Geographic Description

For this review, the Columbia Plateau Province (Figure 1), which is located in central/eastern Washington and Oregon, was divided into North (Yakima, Palouse, and Mainstem Columbia rivers, and Rock and Crab creeks) and South (Deschutes, John Day, Umatilla, Walla Walla, and Lower Mainstem Snake rivers) sections.




COLUMBIA PLATEAU ECOLOGICAL PROVINCE
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Yakima
Toppenish
Sunnyside
Richland
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Kennewick
ICE HARBOR
LOWER MONUMENTAL
LITTLE GOOSE
LOWER GRANITE
Lewiston
Walla Walla
MC NARY
Pendleton
JOHN DAY
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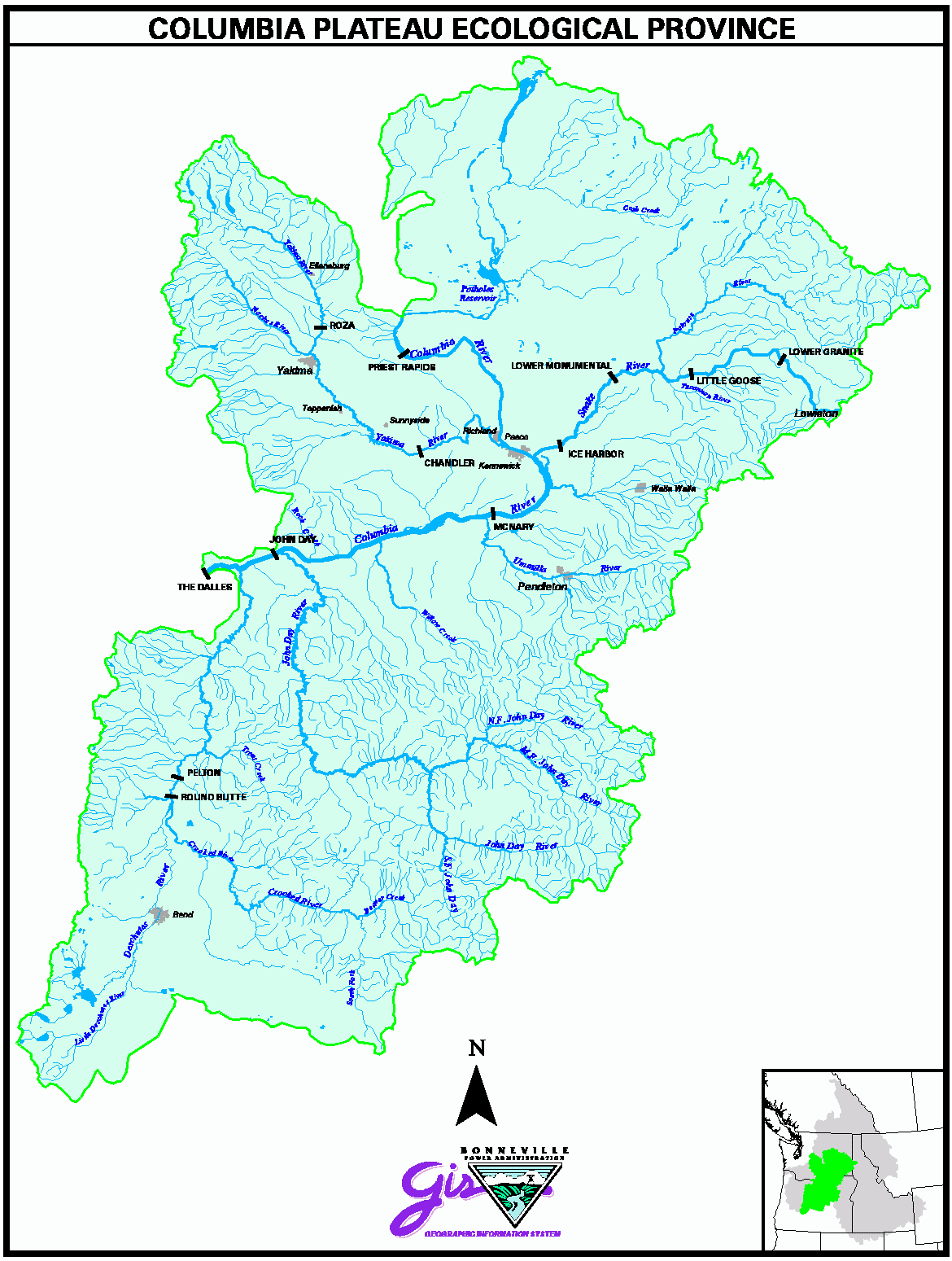
COLUMBIA PLATEAU ECOLOGICAL PROVINCE
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LOWER GRANITE
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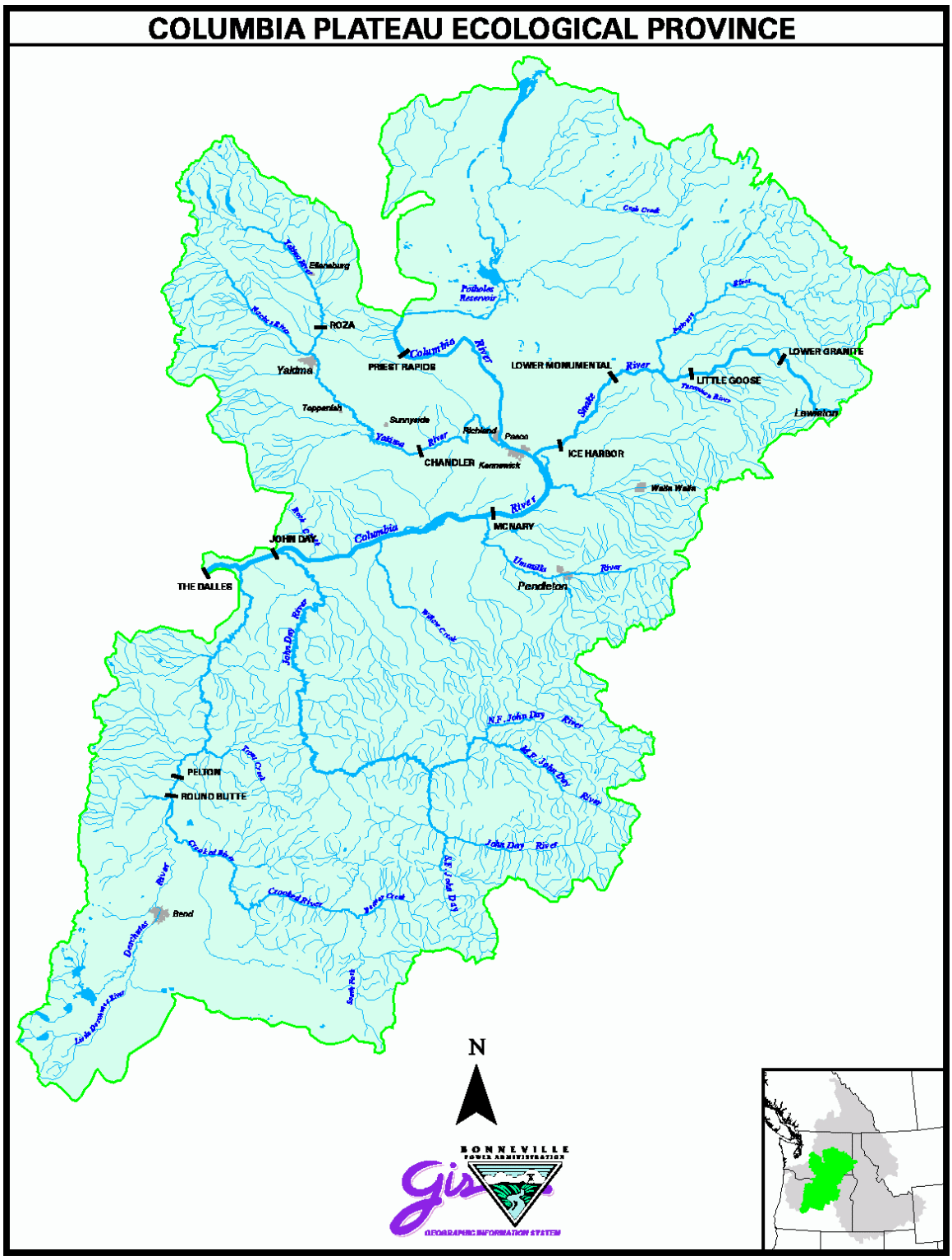

Figure 1. Columbia Plateau Province.

Project Review Process

Subbasin Summaries

The Columbia Plateau Province Review was initiated at a November 28-29, 2000, meeting in Pendleton, Oregon. An invitation was sent to an extensive distribution list to encourage all interested parties (i.e. land and water managers, representatives of watershed councils, etc.) to attend and provide input. The purpose of this first meeting was to provide all interested parties with the opportunity to identify sources of information necessary for the development of subbasin summaries for this province (i.e. monitoring data, habitat restoration results, existing assessments, etc.). The intent was to ensure BPA expenditures for fish and wildlife projects compliment and enhance existing efforts and ensure that priority needs are addressed. Subsequent meetings were held to review draft summaries and identify goals and objectives.

Previously, ecosystem summaries for each subbasin were developed as a means of providing context for project proposals. Under the new process, a more formal structure with subbasin teams was formed to develop the more comprehensive subbasin summaries of the newly identified provinces. Other local interested parties also provided input to and participated on the subbasin teams (i.e. other land and water managers, representatives from watershed councils, etc.).

Subbasin summaries for the Columbia Plateau Province were completed in March 2001. The BPA issued the solicitation for project proposals for the Columbia Plateau Province on March 2, 2001, with project proposals due April 13, 2001. The project sponsors were asked to show a direct tie between their projects and the needs identified in the subbasin summaries.

Review by the ISRP

The ISRP reviewed 166 project proposals for the Columbia Plateau Province. At least three ISRP/Peer Review Group members reviewed each proposal. To ensure a consistent and fair evaluation, standard formats and criteria were applied to all proposals to generate comments and scores prior to the proposal review workshop. These scores and comments were not made available to the project sponsors at the workshop, but were used by the ISRP to develop questions for the site visits and workshop presentations. The workshops consisted of site visits and project presentations.

Site Visits (May 7-8, 2001 (South) and May 14-15, 2001 (North))

The ISRP, subbasin teams, fish and wildlife managers, the CBFWA province review team and other stakeholders toured the province to gain a better understanding of the existing ecological conditions and limiting factors as well as view some ongoing projects in each subbasin. During the tour, managers provided oral presentations for areas/projects within the province that the group was unable to visit.

Project Presentation (May 8-10, 2001 (South) and May 16-18, 2001 (North))

Prior to the presentation of individual project proposals, subbasin team leaders provided a general overview for their respective summaries. Following each subbasin summary

presentation, project proposals relative to that subbasin were presented to the ISRP, CBFWA province review team, fish and wildlife managers, NWPPC staff, CBFWA staff and other stakeholders. All project sponsors were provided 15 minutes to present their proposal and answer questions. During this review, the CBFWA province review team applied Subbasin Project Review Criteria (Table 1) to each project. Every effort was made to be consistent among all project proposals reviewed.

Table 1. The CBFWA subbasin project review criteria.

Technical Criteria	
1. Does the proposal demonstrate that the project uses appropriate scientifically valid strategies or techniques and sound principles (best available science)?	**Y or N**
2. Are the objectives clearly defined with measurable outcomes and tasks that contribute toward accomplishment of the objectives?	**Y or N**
3. Are the resources proposed (staff, equipment, materials) appropriate to achieve the objectives and time frame milestones?	**Y or N**
4. Does the proposal include monitoring and evaluation to determine whether objectives are being achieved (including performance measures/methods) at the project level?	**Y or N**
5. Will the proposed project significantly benefit the target species/ indicator populations?	**Y or N**
6. Does the proposal demonstrate that project benefits are likely to persist over the long term and will not be compromised by other activities in the basin?	**Y or N**
7. Does the proposal demonstrate that all reasonable precautions have been taken, to not adversely affect habitat/populations of wildlife, native resident and anadromous fish?	**Y or N**
8. Are there explicit plans for how the information, technology etc. from this project will be disseminated or used?	**Y or N**
Management Criteria	
1. Does the proposed project address fish and wildlife related objectives, strategies, needs and actions as identified in the subbasin summaries?	**Y or N**
2. Does the project address an urgent requirement or threat to population maintenance and/or habitat protection (i.e., threatened, endangered or sensitive species)?	**Y or N**
3. Does the project promote/maintain sustainable and /or ecosystem processes or maintain desirable community diversity?	**Y or N**
4. Is there cost share for the construction/implementation and/or monitoring and evaluation of the project?	**Y or N**
5. Will the project complement management actions on private, public and tribal lands and does the project have demonstrable support from affected agencies, tribes and public?	**Y or N**
6. Will the project provide data critical for in season, annual and/or longer term management decisions?	**Y or N**
7. Will this project provide or protect riparian or other habitat that may benefit both fish and wildlife?	**Y or N**

Preliminary ISRP Report

On June 15, 2001, the ISRP released a Preliminary Review of Fiscal Year 2002 Project Proposals for the Columbia Plateau Province (ISRP 2001-6 at NWPPC). This report

summarized the ISRP's preliminary review of each project proposal and identified areas of concern where they had requested a written response to questions. The due date for written responses to this report was June 29, 2001.

CBFWA Province Review Group

During July 9-11, 2001 (North), and July 16-18, 2001 (South), the CBFWA Province Review Group reviewed all project proposals within the province using criteria listed in Table 1 which resulted in a consensus Yes or No. Subbasin team members also participated in the review of the project proposals. The following elements were considered during the review:

- How well does the project relate to the criteria (Table 1)
- Validation of existing work- is the current funding level appropriate (Section 6 O&M and Section 7 M&E of existing projects)? Is it appropriate to continue implementation of existing work (Section 4 P&D and Section 5 C&I of existing projects)?
- Evaluation of proposed new work- does a new project proposal demonstrate a priority need over implementation strategies within existing projects (Sections 4 and 5 of existing projects)?

Project proposals were grouped by subbasin during their review. The preliminary ISRP technical review of all proposals was utilized while discussing the technical merits of each project. Following the technical and management review, the project proposals were prioritized within each subbasin according to the fish and wildlife needs within that subbasin. The following definitions were used for the subbasin prioritization:

- Urgent - These projects or tasks within a project are of urgent need. They will either have a direct impact on survival or protection of a key species or will protect investments made in this subbasin. These projects should be able to demonstrate an immediate cost if not funded (loss of habitat, impact on a population, etc.). An example might also include ongoing O&M costs.
- High Priority - These projects or tasks within a project are high priority within the subbasin. The project addresses a specific need within the subbasin summaries.
- Recommended Actions - These are good projects that cannot demonstrate a significant loss by not funding this year. These projects should be funded, but under a limited budget could be delayed temporarily without significant loss.
- Do not fund - These projects are either technically inadequate or do not address a need within the subbasin summaries. These projects may be inappropriate for BPA funding.

CBFWA Review and Approval of Project Recommendations and Subbasin Summaries

The final step in the project proposal review process was the consensus approval of the project recommendations by CBFWA Members. The CBFWA Members Review and the recommendations in the subbasin summaries and province work plan demonstrate regional support by the fish and wildlife managers.

On July 27, 28, and 29, 2001, the province recommendations and subbasin summaries were discussed in the CBFWA Resident Fish, Wildlife, and Anadromous Fish committees, respectively. The committees made some modifications to the province recommendations based on technical or regional management concerns. It was decided to group the Urgent and High Priority projects for the final recommendation to NWPPC since all of these projects should be funded in FY 2002.

Proposal Review Results

A total of 166 project proposals were reviewed in the Columbia Gorge Province (66 ongoing projects and 100 new proposals, (Appendix A). Nine proposals were categorized as "Do Not Fund." Proposals that received a Do Not Fund recommendation are:

- Project Number 25044, *Application of Biological Assessment Protocol to Evaluate Passage of Juvenile Salmonids Through Culverts in the Yakima Basin*, is a proposal that appeared to lack coordination with WDFW and WDOT. The WDFW or WDOT would have to adopt any protocols that are developed through this project.

- Project Number 25037, *Evaluation of the effects of American shad on upstream migration of anadromous fishes at Priest Rapids Dam*, because the proposal did not provide adequate detail and the project sponsor did not to respond to the ISRP, it was not clear why the extensive behavior evaluation is necessary prior to implementing actions to prevent shad from entering the fish ladder at Priest Rapids Dam.

- Project Number 25041, *Wildlife Escape Ramps*, is a proposal in which the CBFWA strongly supports the proposed approach for saving wildlife from drowning in irrigation canals. However, because the tie to the development of the hydrosystem is difficult establish, the proposed work raises a serious in-lieu question that will have to be addressed. These ramps would be constructed in Bureau of Reclamation's canals for the Columbia Basin Project.

- Project Number 25061, *John Day Fish Passage Barrier Inventory*, proposed work that reviewers indicate is not warranted since barriers to fish passage have already been identified and that implementation is ongoing. In addition, there has been no coordination with the management agencies.

- Proposal Number 25076, *Enhancing Riparian Corridors Sustainably With Integrated Agroforestry*, is a proposal project that was conceptually accepted through SRFB. However, there was a concern about the associated costs and the eventual harvest of the trees. The watershed council in the area of this proposed work also expressed concern about the proposed costs. The costs associated with this proposal are high relative to the amount of habitat (40 acres) and the riparian buffers are narrower than NMFS's properly functioning conditions (50 feet). There is no guarantee that the riparian habitat and gained cfs will be preserved. In addition, there is no guarantee that pulp prices will remain high enough to maintain the program. As an experiment, the scale of this project should have been much smaller.

- Proposal Number 25087, *Desolation Creek Rehabilitation and Meadow Restoration,* was an incomplete proposal that was difficult to review and recommend for funding.

- Project Number 25098, *Characterize and Assess Wildlife-Habitat Types and Structural Conditions for Subbasins within the Mountain Columbia Ecoprovince,* is currently being funded under the Ecosystem Diagnosis and Treatment project by the NWPPC. The need for expansion of this project to produce finer resolution within each province should be determined through the EDT assessment process. If that process determines that finer resolution is necessary for regional planning, then funding for expansion should be provided through the NWPPC subbasin assessment effort.

- Project Number 25099, *Oregon CREP Improvement Project,* was a proposal that was incomplete and difficult to evaluate.

- Project Number 25100, *Protect Normative Structure and Function of Critical Aquatic and Terrestrial Habitat,* is a proposal/response that did not appear to address the technical concerns identified by the ISRP. It was unfortunate that the project sponsor did not participate in the project presentation phase of the project review. In addition, This project needs to be better coordinated with the fish and wildlife co-managers in the subbasin.

Three-year Budget Recommendation

Appendix B provides a three-year funding recommendation for the Columbia Plateau Province that strives to meet the goals, objectives and needs of the Province. A total of 141 projects that address needs identified in the subbasin summaries are recommended for funding and include new and ongoing projects totaling $55 million. All of the projects recommended here should be initiated within the next three years. In addition, 16 proposals (11 new and 5 ongoing) totaling $26 million were identified by the CBFWA as proposals that could potentially be implemented as “High Priority” projects pending crediting resolution with BPA and NWPPC. The CBFWA will formally request a policy level meeting to resolve this issue.

Yakima River Subbasin

Sixteen existing projects have been recommended for continued funding in the Yakima River Subbasin (Table 2).

- Project Number 198506200, *Passage Improvement Evaluation*, will continue to evaluate the biological and hydrologic effectiveness of juvenile fish passage facilities constructed at irrigation diversion dams, canals and ditches to allow the passage of migrating fishes.
- Project Number 199105700, *Fabricate and Install Yakima Basin Phase II Fish Screens*, will allow for the fabrication and installation of fish screens and miscellaneous metalwork for Yakima Basin Phase II screening projects.
- Project Number 199107500, *Operate and Maintain Yakima Basin Phase II Fish Screens*, will continue to install new fish screens at previously scheduled diversions in the Yakima River Basin to prevent mortality or injury to anadromous and resident fish
- Project Number 199405900, *Yakima Basin Environmental Education*, will continue to involve students in community problem solving related to local environmental issues, and arrange for area scientists to participate in teacher training sessions and student presentations.
- Project Number 199503300, *O&M of Yakima Phase II Fish Facilities*, will provide for the operation and maintenance of BPA owned fish screening and trapping facilities located throughout the Yakima River basin to prevent injury or mortality to anadromous and resident fish, and to protect BPA's capital investment.
- Project Number 199603501, *Satus Watershed Restoration Project*, will continue to work at the watershed scale to implement restoration projects intended to protect and enhance habitat for the native threatened summer steelhead stock, and a variety of cultural and natural resources.
- Project Number 199705300, *Toppenish-Simcoe Instream Flow Restorations and Assessment*, will continue to identify extent of anadromous populations, identify land status, characterize habitat and discharge; model irrigation use; restore instream flows by land lease or purchase and/or water substitution; modify irrigation diversions to mimic natural runoff.
- Project Number 199803300, *Restore Upper Toppenish Watershed*, will moderate flow regime in Toppenish Creek by increasing the retentiveness of natural soil water storage areas, such as headwater meadows and floodplains, following prioritized plan generated by FY98-99 watershed assessment.
- Project Number 199803400, *Yakama Nation Yakima/Klickitat Fisheries Project (YKFP) Reestablish Safe Access into Tributaries of the Yakima Subbasin*, will continue to rebuilds migratory passage into historically-productive tributary habitats.
- Project Number 19901300, *Ahtanum Creek Watershed Assessment*, will continue to conduct a watershed assessment in the agricultural portion of the Ahtanum Creek watershed to complete assessment of the entire watershed, facilitate protection and restoration of salmon, steelhead, bull trout.
- Project Numbers 199506425, 198812025, 199701325, 198811525, and 19950632, are Yakima/Klickitat Fisheries Project proposals that will continue to implement

objective that have been established through the science-based resource management program

Fifteen new project proposals are recommended for funding in this subbasin (Table 3).

- Project Number 25021, *Implement Actions to Reduce Water Temperatures in the Teanaway Basin*, will implement actions to reduce stream temperatures, reduce suspended sediment, meet water quality standards and improve salmonid habitat. Actions implemented will include irrigation improvements, tree planting, bank stabilization and road improvements.
- Project Number 25013, *Restore Riparian Corridor at Tapteal Bend, Lower Yakima River*, will stabilize streambank along about 500 feet of riparian area at RM 8 of the Lower Yakima River.
- Project Number 25022, *YKFP Big Creek Passage and Screening*, will provide fish passage over a concrete dam with a series of weirs in combination with a short fishway, opening up 10 miles of habitat.
- Project Number 25023, *Yakima-Klickitat Fisheries Project-Manastash Creek Fish Passage and Screening*, will provide fish passage and screening for 5 irrigation diversions and will enhance stream flow which is currently a limiting factor dowstream of these diversions. This project could restore access to approximately 30 miles of good habitat.
- Project Number 25036, *The Impacts of Flow Regulation on Riparian Cottonwood Ecosystems in the Yakima River Subbasin*, will Research riparian cottonwood and geomorphic response to regulated flows in the Yakima Basin and compare to the responses of an unregulated reach of the Flathead River with the objective of enhancing flows to restore riparian habitats in the Yakima Basin.
- Project Number 25054, *Increase Naches River In-Stream Flows by Purchasing Wapatox Hydroelectric Project*, will cost share with Bureau of Reclamation to purchase and retire PacifiCorp's Wapatox Power Plant to benefit salmon and steelhead by increasing instream flows and enhance spawning and rearing habitat in the Naches River.
- Project Number 25062, *Growth Rate Modulation in Spring Chinook Supplementation*, will develop hatchery rearing protocols to reduce excessive production of early maturing male chinook salmon, improve smolt-to-adult survival and reduce negative ecological impacts of hatchery fish on wild fish.
- Project Number 25026, *Yakima Tributary Access and Habitat Program*, will implement fish enhancements (fish passage, screens and riparian habitat) on Yakima tributaries based on prioritized schedule developed through a collaborative approach of local, state, federal and tribal interests.
- Project Number 25031, *Naches River Water Treatment Plant Intake Screening Project*, will screen City of Yakima's Naches Water Treatment Plant intake to eliminate mortality of ESA listed and non-listed salmonids at this location.
- Project Number 25034, *Develop a Nutrient/Food-Web Management Tool for Watershed-River Systems*, will develop method to assess nutrients in water and associated benefits to juvenile fish by using computational fluid dynamics, watershed and food chain models.

- Project Number 25058, *Fish Passage Inventory and Corrective Actions on WDFW Lands in the Yakima Subbasin*, will inventory fish passage structures and intake screens, identify required corrective actions, and complete corrective actions where high priority passage problems exist.
- Project Number 25095, *Pesticides and the Environmental Health of Salmonids in the Yakima Subbasin*, will evaluate the effects of current use pesticides on the physiology and fitness of Chinook salmon. Incorporate empirical data into a spatially explicit model of population viability in the Yakima subbasin.
- Project Number 25096, *Determine Quantitative Values for the Perpetual Timber Rights on the WDFW Oak Creek and Wenas Wildlife Areas*, will assess feasibility of re-acquiring ownership of habitat (timber rights) to refocus land management from timber production and harvest to fish and wildlife habitat protection and enhancement.
- Project Number 25012, *Assessment of Bull Trout Populations in the Yakima River Watershed*, will assess the status of bull trout populations and collect baseline information necessary for the development, implementation and recovery of bull trout inhabiting the Mid Columbia Recovery Unit (i.e., Yakmia Subbasin).
- Project Number 25027, *An Assessment of Neotropical Migratory and Resident Bird-Habitat and Bird-Salmon Relationships to Riparian Ecosystems in the Deschutes Subbasin*, will monitor riparian breeding bird community relative abundance and nest success in relation to vegetation condition on streams in the process of or proposed for restoration, as well as on a subset of streams with salmon carcass supplementation.

Table 2. Projects recommended for funding in the Yakima River Subbasin

ProjectID	Title	Sponsor
199506425	Policy/Technical Involvement and Planning in the Yakima/Klickitat Fisheries Project	WDFW
198812025	Yakima/Klickitat Fisheries Project (YKFP) Management	YIN
199701325	Yakima/Klickitat Fisheries Project Operations and Maintenance	YIN
198811525	Yakima/Klickitat Fisheries Project (YKFP) Design and Construction	YIN
199506325	Yakima/Klickitat Fisheries Project Monitoring And Evaluation	YIN
198506200	Passage Improvement Evaluation	PNNL
199105700	Fabricate and Install Yakima Basin Phase II Fish Screens	WDFW
199107500	Yakima Phase II Screens – Construction*	BOR
199200900	Operate & Maintain (O&M)Yakima Basin Phase II Fish Screens	WDFW
199405900	Yakima Basin Environmental Education	BOR
199503300	O&M Of Yakima Phase II Fish Facilities*	BOR
199603501	Satus Watershed Restoration Project	YIN
199705300	Toppenish-Simcoe Instream Flow Restoration and Assessment	YIN
199803300	Restore Upper Toppenish Watershed	YIN
199803400	Yakama Nation Yakima/Klickitat Fisheries Project (YKFP) Reestablish Safe Access into Tributaries of the Yakima Subbasin	YIN
199901300	Ahtanum Creek Watershed Assessment	YIN
25021	Implement Actions to Reduce Water Temperatures in the Teanaway Basin	WDOE
25013	Restore Riparian Corridor at Tapteal Bend, Lower Yakima River	Tapteal Greenway
25022	YKFP Big Creek Passage & Screening	WDFW
25023	Yakima-Klickitat Fisheries Project - Manastash Creek Fish Passage and Screening	WDFW

ProjectID	Title	Sponsor
25036	The Impact of Flow Regulation on Riparian Cottonwood Ecosystems In the Yakima River Basin.	BioQuest International Consulting Ltd.
25054	Increase Naches River In-stream Flows By Purchasing Wapatox Hydroelectric Project	YIN
25062	Growth Rate Modulation in Spring Chinook Salmon Supplementation	NMFS, NOAA, DOC
25026	Yakima Tributary Access and Habitat Program (YTAHP)	Kittitas County Water Purveyors
25031	Naches River Water Treatment Plant Intake Screening Project.	City of Yakima
25034	Develop a Nutrient/Food-Web Management Tool for Watershed-River Systems	PNNL
25058	Fish Passage Inventory and Corrective Actions on WDFW Lands in The Yakima Subbasin	WDFW
25095	Pesticides and the environmental health of salmonids in the Yakima subbasin.	NMFS
25096	Determine Quantitative Values for the Perpetual Timber Rights on the WDFW Oak Creek and Wenas Wildlife Areas.	WDFW
25027	An Assessment of Neotropical Migratory and Resident Bird-Habitat and Bird-Salmon Relationships to Riparian Ecosystems in the Deschutes Subbasin (Changed to Yakima Subbasin)	NHI
25012	Assessment of bull trout populations in the Yakima River watershed.	WDFW

Eight (6 new and 2 existing) project proposals were identified that could potentially be implemented as "High Priority" pending crediting resolution with BPA and NWPPC (Table 3).

- Project Number 199206200, *Yakima Nation – Riparian/Wetlands Restoration*, will continue implementation of YN Wetlands/Riparian Restoration Project by protecting and restoring native floodplain habitats along anadromous fish-bearing waterways in the agricultural area of the Yakama Reservation (~2,500 acres/year).
- Project Number 199705100, *Yakama Nation Yakima/Klickitat Fisheries Project (YKFP) Yakima Side Channels*, will continue to support the Yakama Nation's (YN) activities related to YKFP habitat improvement and acquisition activities in the Yakima Subbasin. The project goal is to protect and restore off-channel rearing habitats in priority mainstem reaches.
- Project Number 25002, *Protect, Enhance, and Maintain Habitat on the Sunnyside Wildlife Area to Benefit Wildlife and Fish Assemblages*, will restore, protect and enhance native floodplain wetland and riparian habitats and shrubsteppe uplands in the lower Yakima River Valley.
- Project Number 25024, *Yakima-Klickitat Fisheries Project-Wilson Creek Snowden Parcel Acquisition*, will acquire a portion of Wilson Creek, and its associate floodplain at Ellensburg, Washington, and perform riparian restoration activities.
- Project Number 25025, *YKFP-Secure Salmonid Spawning and Rearing Habitat on the Upper Yakima River*, will purchase 370 acres of upper Yakima River wetlands through fee simple acquisition to secure spawning and rearing habitat for salmonids.
- Project Number 25032, *Wenas Wildlife Area Holding Acquisitions*, will acquire 800 acres of inholding lands within the Wenas Wildlife Area, including 1.25 miles of Umtanum Creek. Lands are under immediate threat of development. Includes riparian and Shrub steppe habitat, provides landscape connectivity.

- Project Number 25078, *Acquire Anadromous Fish Habitat in the Selah Gap to Union Gap Flood Plain, Yakima River Basin, Washington*, will acquire essential anadromous fish habitat (flood plains, riparian zones, wetlands, and water rights) from Selah Gap to Union Gap "Critical River Reach" of the Yakima River Basin, Washington.
- Project Number 25020, *Acquire Rattlesnake Slope Addition*, will acquire 11,000 acres in the Yakima subbasin to protect key shrub-steppe habitat, link protected lands, assist with threatened and endangered species recovery, and facilitate comprehensive management over a large area.

Table 3. Projects that could potentially be implemented as "High Priority" in the Yakima River Subbasin pending crediting resolution with BPA and NWPP.

ProjectID	Title	Sponsor
199206200	Yakama Nation – Riparian/Wetlands Restoration	YIN
199705100	Yakama Nation Yakima/Klickitat Fisheries Project (YKFP) Yakima Side Channels	YIN
25002	Protect, enhance, and maintain habitat on the Sunnyside Wildlife Area to benefit wildlife and fish assemblages.	WDFW
25024	Yakima-Klickitat Fisheries Project - Wilson Creek Snowden Parcel Acquisition	WDFW
25025	YKFP -- Secure Salmonid Spawning and Rearing Habitat on the Upper Yakima River	WDFW
25032	Wenas Wildlife Area Inholding Acquisitions	WDFW
25078	Acquire Anadromous Fish Habitat in the Selah Gap to Union Gap Flood Plain, Yakima River Basin, Washington	BOR
25020	Acquire Rattlesnake Slope Addition	Rocky Mountain Elk Foundation

The suite of recommended project proposals addresses the key needs identified in the Yakima River Subbasin Summary including:

- Restore the productivity of floodplain properties in priority mainstem reaches.
- Reconnect tributaries to the mainstem Yakima and Naches River by restoring flows, and removing or modifying barriers.
- Purchase private properties to reconnect the floodplain, and restore and protect riparian habitat and natural hydrologic regime.
- Acquire floodplain habitats along the mainstem Yakima and Naches Rivers.
- Implement on-farm water conservation for mainstem diverters where saved water can be re-allocated to instream flows.
- Buy the Wapatox Power Plant to benefit salmon and steelhead by increasing instream flows in the lower Naches River.
- Recommend alternatives for establishing more normative flow regimes in the Yakima core area.
- Evaluate management options for municipal aquifer and surface water withdrawals that would improve the timing of water extraction to minimize impacts on water supply.
- Screen diversions from Yakima River tributaries.
- Evaluate culvert modifications to determine if passage conditions have improved.

- Identify and repair, or remove, or relocate road and culverts that are susceptible to mass wasting and bank failures; that negatively impact riparian areas, and inhibit connectivity and natural stream functions in all fish-bearing watersheds.
- Continue monitoring new and existing fish passage facilities within the Yakima River basin to ensure that they are adequately protecting fish and are being operated and maintained to meet NMFS fish protection criteria.
- Properly screen all remaining major water diversions on Yakima River Basin tributaries where fish or habitat may be affected by diversions and barriers.)
- Restore migratory access to the historic range of anadromous fishes through construction of fishways, screens, pumps and on-farm irrigation systems that will allow safe access to productive spawning and rearing habitats in key tributaries.
- Screen all water diversions and irrigation ditches which may create low water barriers and increase stranding of bull trout in the Yakima core area (e.g., Beck Diversion, John-Cox Ditch, Wapato Irrigation Project Diversion, Rattlesnake Creek, Teanaway River).
- Prevent fish mortalities, including of ESA-listed salmonids, caused by the Naches River Water Treatment Plant intake systems.
- Improve water quality throughout the Subbasin by addressing each of the factors contributing to impaired water quality.
- Restore sloughs, ponds, and side channels within to restore natural ecological processes and habitat of the area and help reduce water temperatures.
- Initiate a water quality monitoring program in the lower Yakima River below Kiona, where no monitoring is currently being conducted.
- Develop and implement adaptive livestock grazing management plans which include performance standards and targets for habitat and water quality conditions that grazing practices must meet
- Purchase outright or purchase conservation easements for the establishment of riparian zones along anadromous- and other fish-bearing streams in the Yakima Basin.
- Improve habitat structure (i.e., riparian planting, instream structures) in irrigation return drains and wasteways accessible to anadromous fish.
- Make off-channel watering improvements through additional fencing and
- revegetation.
- Control noxious weeds especially along the lower Yakima River, especially within the Chamna Natural Preserve and replace exotic plants with native species (willows, roses, etc.) to restore wetland and riparian areas.
- More efficient conveyance and use of water withdrawn from the Naches River for the City of Yakima is needed.
- Continue using EDT model to determine stream reaches that have high value for protection and restoration in salmon recovery efforts. Use model to determine relative benefits of habitat restoration and supplementation for all species and stocks of salmonids.
- Continue research on Spring Chinook to determine if supplementation can increase natural production and harvest while maintaining genetic resources. Determine if

new hatchery rearing techniques can improve the survival and fitness of supplemented fish.

- Determine the reproductive ecology and success of supplementation produced adults compared to naturally produced fish.
- Monitor genetic structure of supplemented salmonid stocks.
- Monitor the ecological interactions of supplementation fish within the natural ecosystem (competition, predation, predator avoidance, residualism and precocialism)
- Determine the feasibility of re-establishing a sustainable, naturally spawning coho population in the Yakima Subbasin with sufficient productivity to sustain a meaningful in-basin fishery in most years.
- Optimize production of naturalized populations of coho with respect to abundance and distribution.
- Minimize adverse impacts of reintroduced coho on other species.
- Establish a Yakima River coho stock with heritable life history traits adapted to the Yakima Subbasin.
- Determine the feasibility of supplementing the two stocks of fall chinook in the Yakima Subbasin.
- Refine the knowledge of genetic structure of steelhead and resident rainbow trout.
- Determine if steelhead kelt reconditioning can be used to increase natural production in the Yakima Subbasin.
- Investigate the feasibility of reintroduction of summer chinook and sockeye salmon in the Yakima Subbasin.
- Continue spawning ground surveys for all salmonids.
- Continue estimating adult returns of all salmonids.
- Resolve uncertainties about the role conditions in the lower Yakima River play in the natural production of the basin's fall chinook salmon; that is, address subyearling fall chinook survival; assess the quantity and quality of fall spawning and rearing habitat below Prosser and elsewhere; estimate channel fish predation more precisely; understand life histories of channel catfish and other non-native predators; and evaluate costs and benefits of increasing connectivity of lower Yakima River to the mainstem Columbia River, which would increase potential fall chinook habitat.
- Continue monitoring the physiological development of Yakima hatchery spring chinook salmon to further evaluate and improve the ability of supplementation hatcheries to produce high quality smolts with morphological, physiological, behavioral, and life-history attributes similar to wild fish.
- Future studies should be conducted to more accurately determine the incidence of precocious male maturation in both wild and hatchery populations of Yakima spring chinook
- Future studies should be conducted at the Cle Elum Supplementation and Research facility to develop rearing strategies for controlling precocious male maturation in the hatchery population.
- At least three genetically distinct stocks of spring chinook salmon have been identified in the Yakima River. Increased levels of straying due to hatchery rearing or acclimation/release practices may have negative genetic and ecological impacts on existing wild populations. Future physiology studies of juvenile spring Chinook

should incorporate assessment of imprinting by juveniles released from different acclimation sites and ultimately compare these data with patterns of homing displayed by returning adults.

- Obtain and utilize information from outside sources —with various state and federal agencies, other research programs, hatcheries, and university researchers—regarding environmental and harvest-related impacts on all anadromous salmonids occurring outside the Yakima basin.
- Identify and assess site-specific threats that are likely having a negative effect on the suitability of bull trout habitats used for spawning, rearing (adult and juvenile), migrating, and over-wintering.
- Investigate alternative means to reduce or eliminate the possibility of entrainment losses in the outlet works of all the storage dams.
- Investigate feasibility of providing fish passage at Keechelus, Kachess, Cle Elum, Bumping, and Rimrock Reservoirs, Clear Lake and Big Creek diversion dam.
- Evaluate reservoir operations as they relate to water level manipulations and provide recommendations to insure successful passage to and from natal streams for adfluvial bull trout populations.
- Assess effects of residential and shoreline/floodplain development in known bull trout habitat (e.g., Lower Little Creek and Naches River).
- Information regarding the lacustrine life-stage of bull trout is needed for all five basin reservoirs —Keechelus, Kachess, Cle Elum, Rimrock, and Bumping. (As discussed in Limiting Factors, fragmentation and isolation of bull trout populations or subpopulations occurred as a result of the construction of water storage dams in the Yakima subbasin.)
- Evaluate bull trout hybridization with brook trout and presence and effects of viable hybrids.
- Conduct intensive bull trout distribution and spawning surveys in the North and Middle Fork Teanaway, Cle Elum River, American River, Yakima River between Easton and Keechelus Lake, Cowichee Creek and other areas. Continue to conduct bull trout spawning surveys.
- Determine movement and seasonality of use of different habitat types of adult and sub-adult migratory bull trout with specific emphasis on the mainstem Yakima River.
- Evaluate the impact of resident trout fisheries on anadromous fish, particularly ESA listed species such as steelhead and bull trout. Biologists need to evaluate the response of resident trout and anadromous fish populations to sport fishing regulations implemented since the late 1980's (WDFW 1984; Wright 1992). The impact of fish stocking practices, particularly downstream movement of fish from lakes and reservoirs is not known.
- Ensure bull trout recovery strategies are included as part of, and coordinated with other recovery efforts and management plans.
- Educate the public about the importance of the lower reaches of the river.
- Educate students about: the components of the environment and impacts of human interactions within natural systems, the ways in which social and natural systems are fundamental in supporting our lives, economy and emotional well being, the fact that

individual decisions and actions effect the environment, the ways in which cooperative action can be used to maintain and enhance the environment.
- Educate the public about laws pertaining to protection of fish and wildlife and their habitats.
- Educate the public on the need and options for effective streambank protection and habitat restoration.
- Educate Yakama Nation members in Fish Culture technology.
- Reconnect tributaries to the mainstem Yakima and Naches River by restoring flows, and removing or modifying barriers.
- Screen diversions from Yakima River tributaries. Priority should be placed on screens within stream reaches presently accessible to anadromous fish and proceed upstream in advance of passage projects as described above.
- Recommend alternatives for establishing more normative flow regimes in the Yakima core area.

Rock Creek Subbasin

One new project proposal has been recommended for funding in the Rock Creek Subbasin (Table 4). Project Number 25068, *Rock Creek Watershed Road and Riparian Improvement Project*, will perform habitat restoration to stabilize mainstem Rock Creek channel, enhance riparian corridor vegetation characteristics, and improve the road network throughout the subbasin to benefit fish and wildlife.

Table 4. Projects recommended for funding in the Rock Creek Subbasin.

ProjectID	Title	Sponsor
25068	Rock Creek Watershed Road and Riparian Improvement Project	YIN

This proposal addresses the following key needs identified in the subbasin summary:
- Protection and restoration of native fish populations
- Reduction in water temperatures in Rock Creek and its tributaries
- Restoration of incised and widened stream channels
- Monitor and evaluate the magnitude and extent of sediment delivery and siltation.

Palouse River Subbasin

One new project proposal has been recommended for funding in the Palouse River Subbasin (Table 5). Project Number 25008, *Resident Fish Stock Status in the Palouse River and Upper Crab Creek Watersheds, Washington*, will collect baseline fish related data for the Palouse River and Crab Creek drainages. The baseline data will be compiled into a database, with existing data, for managers, as well as be used to develop fish management plans

Table 5. Projects recommended for funding in the Palouse River Subbasin.

ProjectID	Title	Sponsor
25008	Resident Fish Stock Status in the Palouse River and Upper Crab Creek Watersheds, Washington	WDFW

One new project proposal was identified that could potentially be implemented as "High Priority" pending crediting resolution with BPA and NWPPC (Table 6). Project Number 25092, *Restoration of Healthy Watersheds to Palouse River Drainage in Idaho*, will restore degraded habitat and protect natural habitat in the Palouse River drainage in Idaho thereby improving water quality and quantity throughout the drainage.

Table 6. Projects that could potentially be implemented as "High Priority" in the Palouse River Subbasin pending crediting resolution with BPA and NWPP.

ProjectID	Title	Sponsor
25092	Restoration of Healthy Watersheds to Palouse River Drainage in Idaho	IDFG

The suite of recommended project proposals addresses the following key needs identified in the subbasin summary:

- Conduct baseline fish resource assessments of the Palouse River system, including its major tributaries, for fish stock assessments and population inventories to estimate population strength and population dynamics, such that fish management plans can be developed which will guide future enhancement and management activities.
- Evaluate in-stream habitat and riparian habitat conditions along the Palouse River system, including its major tributaries, to identify beneficial habitat and fish passage improvements, such that future funding for fish passage and habitat improvement work can be focused at addressing sub-basin and point location fish habitat deficiencies.

Crab Creek Subbasin

Two existing projects have been recommended for continued funding in the Crab Creek Subbasin (Table 7). Project Number 199106100, *Swanson Lakes Wildlife Area (SLWA*), will continue to protect, increase, and maintain a viable sharp-tailed grouse meta population, re-establish a viable sage grouse population, increase mule deer use of the project site, and enhance shrubsteppe habitat for shrub-steppe obligate species. Project Number 199404400, *Enhance, Protect, and Maintain Shrub-steppe Habitat on the Sagebrush Flat Wildlife Area (SFWA*), will continue to protect, and enhance shrub-steppe habitat necessary to maintain and expand viable populations of pygmy rabbits, sage grouse, sharp-tailed grouse and other shrub-steppe obligate species.

Six new project proposals have been recommended for funding in the Crab Creek Subbasin (Table 7).

- Project Number 25043, *Northern Leopard Frog Distribution and Habitat Association*, will examine the breeding distribution of northern leopard frogs, and breeding success and recruitment in association with introduced fish, bullfrogs and reservoir inundation.
- Project Number 25030, *Factors Limiting the Shrub-steppe Raptor Community in the Columbia Plateau Province of Eastern Washington*, will assess habitat, prey, and contaminants of ferruginous hawks and golden eagles in native habitats and provide

recommendations on how to improve their rates of nest occupancy in the Columbia Basin.

- Project Number 25039, *Effects of Agricultural Conversion on Shrub-steppe Wildlife and Condition of Extant Shrub-steppe Habitat*, will map shrub-steppe vegetation using a detailed classification system and determine habitat associations of shrub-steppe wildlife to support restoration and conservation in the Columbia Plateau Province.
- Project Number 25046, *A Cooperative Approach to Evaluating Avian and Mammalian Responses to Shrub-steppe Restoration in the Creek Crab Subbasin*, will evaluate the effectiveness of various restoration strategies in producing necessary habitat for Mammals.
- Project Number 25089, *The Effects of Agriculture on Amphibians of the Columbia Plateau*, will compare historic versus current distribution of four amphibian species, representing different hydorperiod requirement to determine how agriculture affects these species, to identify valuable conservation areas, and to refine distribution model.
- Project Number 25042, *Pygmy Rabbit Recovery-Captive Breeding*, involves captive husbandry and captive breeding of wild-caught Washington pygmy rabbits, as well as augmentation of wild populations in the Crab Creek Subbasin with captive reared rabbits.

Table 7. Projects recommended for funding in the Crab Creek Subbasin.

ProjectID	Title	Sponsor
199106100	Swanson Lakes Wildlife Area (SLWA)	WDFW
199404400	Enhance, Protect, and Maintain Shrub-steppe Habitat on the SageBrush Flat Wildlife Area (SFWA)	WDFW
25001	Acquire Sharp-tailed Grouse Habitat at the Swanson Lakes Wildlife Area	WDFW
25043	Northern Leopard Frog Distribution and Habitat Association	WDFW
25030	Factors Limiting the Shrub-steppe Raptor Community in the Columbia Plateau Province of Eastern Washington	WDFW
25039	Effects of Agricultural Conversion on Shrub-steppe Wildlife and Condition of Extant Shrub-steppe Habitat	WDFW
25046	A Cooperative Approach to Evaluating Avian and Mammalian Responses to Shrub-steppe Restoration in the Creek Crab Subbasin	WDFW
25089	The Effects of Agriculture on Amphibians of the Columbia Plateau	WDFW
25042	Pygmy Rabbit Recovery – Captive Breeding	WDFW

One new project proposal was identified that could potentially be implemented as "High Priority" pending crediting resolution with BPA and NWPPC (Table 8). Project Number 25001, *Acquire Sharp-tailed Grouse Habitat at the Swanson Lakes Wildlife Area*, will purchase 259 ha (640 ac) of shrub-steppe habitat currently bordered on three sides by the SLWA in order to increase and maintain a viable sharp-tailed grouse population on and/or near the SLWA.

Table 8. Project that could potentially be implemented as "High Priority" in the Crab Creek Subbasin pending crediting resolution with BPA and NWPP.

ProjectID	Title	Sponsor
25001	Acquire Sharp-tailed Grouse Habitat at the Swanson Lakes Wildlife Area	WDFW

The suite of recommended project proposals addresses the key needs identified in the Crab Creek Subbasin Summary including:

- Obtain detailed distribution and description of shrub-steppe habitats with reference to dominant plant species, vegetative condition, and habitat potential.
- Continue and/or expand surveys to monitor distribution, abundance, and viability of species of interest including sage grouse, sharp-tailed grouse, pygmy rabbit, Washington ground squirrel, ferruginous hawk, golden eagle, and neotropical migrants.
- Evaluate shrub-steppe habitat characteristics in relation to use by shrub-steppe obligates such as sage grouse, sharp-tailed grouse, pygmy rabbits, Washington ground squirrels, and neotropical migrants.
- Evaluate shrub-steppe restoration activities in relation to wildlife potential; including activities associated with BPA, WDFW, BLM, USFWS, NRCS, and private land.
- Evaluate landscape configuration in relation to population viability for species of interest including sage grouse, sharp-tailed grouse, pygmy rabbits, Washington ground squirrels, and neotropical migrants.
- Expand shrub-steppe quantity with the aid of acquisitions, easements, and landowner incentives such as the Conservation Reserve Program.
- Enhance shrub-steppe in poor quality with implementation and expansion of shrub-steppe restoration activities.
- Enhance and maintain artificial wetlands within the Columbia Basin Irrigation Project to support habitat diversity and wildlife production including breeding ducks and northern leopard frogs.
- Enhance artificial wetlands within the Columbia Basin Irrigation Project to allow for water level management, where possible, to maximize wildlife benefits and better simulate the drought/wet cycle experienced by natural wetlands within the subbasin.
- Control invasive-exotic vegetation throughout the subbasin to improve nesting habitats, food sources, and reduce nest-predator habitat.
- Provide a suitable matrix of breeding, feeding, drinking, and hibernating habitat for bats.
- Improve riparian habitats along Crab Creek and associated tributaries for fish and wildlife; reduce and mitigate impacts from crop production and livestock grazing activities.

Mainstem Columbia River Subbasin

Three existing projects have been recommended for continued funding in the Mainstem Columbia River Subbasin (Table 9). Project Number 199009200, *Protect and Enhance the Wanaket Wildlife Mitigation Area,* will protect, enhance, and mitigate wildlife and wildlife habitats impacted by the McNary Hydroelectric Project. Project Number 199406900, *Estimate Production Potential of fall Chinook Salmon at the Hanford Reach of the Columbia River,* will develop a production potential estimate for fall chinook

salmon in the Hanford Reach, and evaluate whether the Hanford Reach functions as a healthy alluvial river. Project Number 199701400, *Evaluation of Juvenile Fall Chinook Stranding on the Hanford Reach,* will estimate the number of rearing wild juvenile upriver bright fall chinook killed or placed at risk in a 17 mile section of the Hanford Reach during the implementation period of the year 2002 Special Operations Plan for the Priest Rapids Project.

Thirteen new project proposals have been recommended for funding in the Mainstem Columbia River Subbasin (Table 9).

- Project Number 25060, *Burbank Sloughs and Mainstem Columbia River Shoreline/Side Channel/Wetland Habitat Restoration,* will remove berms, reconnect side channels & wetlands to river & establish flow, & enhance shallow-water areas to provide rearing, resting & predator avoidance habitat adjacent to the main channel Columbia River in the Burbank Sloughs Area, Pasco, Washington.
- Project Number 25052, *Sex Reversal in Hanford Reach Fall Chinook Salmon,* will determine if the prevalence of male specific genetic markers in juvenile fall chinook salmon in the Hanford Reach is consistent with phenotype, and whether this evidence of sexual disruption is associated with biomarkers of contaminant exposure.
- Project Number 25079, *Integration and Construction of a GIS Based 2-Dimensional Hydraulic/Habitat Model for 51 miles of Hanford Reach and Site of the Columbia River,* will provide for the integration and construction of a GIS Database and 2-Dimensional Hydraulic/Habitat Model for 51 miles of the Hanford Reach and Hanford Site of the Columbia River.
- Project Number 25097, *Salmon and Steelhead Inventory and Assessment Project,* will provide routed & segmented hydrolayer, and collate and synthesize data on 19 aquatic habitat variables & pesticide data over an estimated 59,000 mi of streams in 8 salmonid-bearing subbasins in the WA portion of this Province.
- Project Number 25101, *Use of Mainstem Habitats by Juvenile Pacific Lamprey,* will characterize the use of main-stem riverine habitats by juvenile Pacific lamprey and use this information to refine restoration strategies within the Columbia River basin.
- Project Number 25011, *Assess Riparian Conditions Through Spectrometric Imaging of Riparian Conditions,* will document riparian vegetation for all Columbia Plateau Province lands within Oregon. DEQ will use the data to establish TMDLs to improve water quality for fish and aquatic life, including ESA-listed species.
- Project Number 25035, *Evaluate Adult Fall Chinook Salmon Fallback at Priest Rapids Dam, Columbia River,* will improve estimates of Hanford Reach fall chinook salmon escapement by assessing the rate, route, fate, and energy-use of adult fall chinook salmon that fall back at Priest Rapids Dam.
- Project Number 25038, *Effects of Hydropower Operations on Fall Chinook Spawning Activity,* will assess the relationship between hydropower project operations and spawning activity of fall chinook salmon in dam tailrace areas. Develop a data set of 24 h/day spawning activity to be regressed against daylight and project discharge data.
- Project Number 25045, *Determine the Effects of Water-level Induced Changes in Rearing habitat on the Survival of Juvenile Fall Chinook Salmon,* will describe the

response of pre-migrant fall chinook salmon to water level-induced changes in their rearing habitat in terms of their habitat use, movement behavior, and survival.

- Project Number 25056, *Conduct Watershed Assessments for Priority Watersheds on Private Lands in the Columbia Plateau*, will coordinate the development of watershed assessments throughout the Columbia Plateau. The funding will provide contracting monies for the completion of watershed assessments throughout the Oregon portion of the province.
- Project Number 25063, *Subbasin Planning Coordinator for Oregon*, will provides a state coordinator to integrate subbasin planning with the Oregon Plan for Salmon and Watersheds.
- Project Number 25070, *The Application of Geophysics to Better Define Fall Chinook Salmon Spawning Habitat Use in the Hanford Reach, Columbia River*, will assess the use of efficient state of the art geophysical technology to better define fall chinook spawning habitat use based upon geomorphological and hyporehic factors.
- Project Number 25091, *Mainstem Habitats and Aquatic Communities: Assessment and Management Options*, will characterize the nearshore habitat and community structure in the mainstem reservoirs of the Columbia Plateau Province, and develop experiments to test management options in the mainstem river.

Table 9. Projects recommended for funding in the Mainstem Columbia River Subbasin.

ProjectID	Title	Sponsor
199009200	Protect and Enhance the Wanaket Wildlife Mitigation Area	CTUIR
199406900	Estimate Production Potential of fall Chinook Salmon at the Hanford Reach of the Columbia River	PNNL
199701400	Evaluation of Juvenile Fall Chinook Stranding on the Hanford Reach	WDFW
200002500	Eagle Lakes Ranch Acquisition and Restoration	USFWS
25060	Burbank Sloughs and Mainstem Columbia River Shoreline/Side Channel/Wetland Habitat Restoration	USFWS
25052	Sex Reversal in Hanford Reach Fall Chinook Salmon	CRRL
25079	Integration and Construction of a GIS Based 2-Dimensional Hydraulic/Habitat Model for 51 miles of Hanford Reach and Site of the Columbia River, will provide for the integration and construction of a GIS Database and 2-Dimensional Hydraulic/Habitat Model for 51 miles of the Hanford Reach and Hanford Site of the Columbia River	USFWS
25097	Salmon and Steelhead Inventory and Assessment Project	WDFW
25101	Use of Mainstem Habitats by Juvenile Pacific Lamprey	PNNL
25011	Assess Riparian Condition through Spectrometric Imaging of Riparian Vegetation	ODEQ
25035	Evaluate Adult Fall Chinook Salmon Fallback at Priest Rapids Dam, Columbia River	PNNL, GAI
25038	Effects of Hydropower Operations on Fall Chinook Spawning Activity	PNNL
25045	Determine the Effects of Water-level Induced Changes in Rearing habitat on the Survival of Juvenile Fall Chinook Salmon	USGS
25056	Conduct Watershed Assessments for Priority Watersheds on Private Lands in the Columbia Plateau	OWEB
25063	Subbasin Planning Coordinator for Oregon	OWEB
25070	The Application of Geophysics to Better Define Fall Chinook Salmon Spawning Habitat Use in the Hanford Reach, Columbia River	PNNL, GAI
25091	Mainstem Habitats and Aquatic Communities: Assessment and Management Options	USGS

One existing project proposal was identified that could potentially be implemented as "High Priority" pending crediting resolution with BPA and NWPPC (Table 10). Project Number 200002500, *Eagle lakes Ranch Acquisition and Restoration*, will protect and

restore proper function to shrub steppe and wetland habitats to offset losses due to hydropower development on the Columbia River system.

Table 10. Project that could potentially be implemented as "High Priority" in the Mainstem Columbia River Subbasin pending crediting resolution with BPA and NWPP.

ProjectID	Title	Sponsor
200002500	Eagle Lakes Ranch Acquisition and Restoration	USFWS

The suite of recommended project proposals addresses the key needs identified in the Mainstem Columbia River Summary including:

- Assess the effects of hydropower system operations on salmon spawning activity in the Hanford Reach and in the tailrace areas of mainstem dams.
- Assess fall chinook salmon fall back at Priest Rapids Dam (PRD).
- Connect mainstem habitats with lower reaches of major tributaries, but only after evaluating the costs and benefits of increased migration, predation and competition of exotics, and expanded life history opportunities of anadromous fish populations.
- Add large woody debris, create shallow water areas, enhance alcove, slough, and side channel connections to the main channel, establish emergent aquatic plants in shallow water areas, and stabilize reservoir water levels (NMFS 2000).
- Quantify the spatial and temporal relationships among life history driven habitat requirements for fall chinook salmon. Specifically, evaluate the relationship and relative importance of habitat patches and identify locations of critical habitat that supports all life history stages (e.g., spawning, rearing, adult holding).
- Estimate the quantity and production potential of available fall chinook rearing habitat in McNary, John Day, and The Dalles reservoirs.
- Estimate growth potential and survival of juvenile fall chinook salmon in the Hanford Reach and through McNary and John Day reservoirs.
- Develop indicators of ecosystem health for the Hanford Reach, and evaluate existing conditions relative to those indicators.
- Apply the concepts and empirical relationships developed under the Hanford Reach fall chinook conceptual spawning habitat model to other alluvial reaches, in order to improve estimates of production potential and identify reaches with greatest restoration potential.
- Develop a greater understanding of steelhead production (spawning and rearing) and habitat requirements in the Hanford Reach.
- Increase understanding of habitat use of adult and juvenile Pacific lamprey in the Hanford Reach and tailraces of mainstem dams.
- Identify the combined effects of elevated summer water temperatures that meet or exceed regulatory criteria and exposure to acute stressors on the physiology, performance, and survival of juvenile fall chinook salmon.

- Research methods to provide cool water for migrating salmonids. Assess existing and potential for cold water refugia.
- Determine the location and effects of ground water input, tributary input, and cold water habitat by use of forward looking infrared radiometry technology.
- Evaluate relationships between exotic fish predator (smallmouth bass, walleye, and channel catfish) abundance and operation of the hydropower system. Assess feasibility of reducing predation on juvenile salmonids through changes in operations or by other means.
- Develop an energy budget for juvenile fall chinook salmon that use the Hanford Reach and Wanapum Dam tailrace.

Deschutes River Subbasin

Three existing projects have been recommended for continued funding in the Deschutes River Subbasin (Table 11). Project Number 198805306, *Hood River Production Program*, will re-establish a self-sustaining spring chinook salmon population in the Hood River subbasin. Broodstock will be collected from Hood River and held at the Parkdale Facility. Incubation and rearing completed at Round Butte Hatchery-Pelton Ladder. Project Number 199404200, *Trout Creek Habitat Restoration*, will continue to provide O&M and construction of instream and riparian habitat improvement; Monitoring and Evaluation of Summer steelhead smolt production and habitat recovery; coordination for basin long range plan with a goal to increase native ESA listed stock. Project Number 199802800, *Trout Creek Watershed Improvement Project*, will continue to implement of practices that will enhance steelhead smolt production and habitat recovery following completion of a watershed assessment/long-range plan currently being conducted.

Ten new project proposals have been recommended for funding in the Deschutes River Subbasin (Table 11).

- Project Number 25005, *Bighorn Sheep Reintroduction to the Warm Springs Reservation*, will reintroduce Bighorn Sheep to the Mutton Mountains area of the Warm Springs Reservation. Bighorn Sheep were indigenous to the Mutton Mountains but were extirpated in the early 1900's.
- Project Number 25007, *Determine Lamprey Species Composition, Larval Distribution and Adult Abundance*, will determine lamprey species composition and larval distribution in the Deschutes River and tributaries. Adult abundance will be estimated in the Deschutes River.
- Project Number 25009, *Assess Watershed Health and Coordinate Watershed Councils in Wasco County, Oregon*, will provide for assessment of 5th-field watersheds using Oregon Watershed Assessment Manual & will provide watershed council support to five watershed councils in Wasco County, Oregon.
- Project Number 25014, *Establish Riparian Buffer Systems*, will implement riparian buffer systems using cost share provided by USDA, State of Oregon, and private landowners (RPA Action 152).

- Project Number 25015, *Emergency Flow Augmentation for Buck Hollow*, will Augment stream flow in Buck Hollow Creek during 2001 with 1-1.5 cfs from headwater well
- Project Number 25040, *Collection of Baseline Measurements of Flow, Temperature, Channel Morphology, Riparian Condition, and Benthic Invertebrates, Trout Creek, Oregon*, will measure physical and ecological habitat conditions prior to an extensive channel restoration project, thus enabling future quantitative evaluation of processes and conditions affected by channel restoration.
- Project Number 25048, *Accelerate the Application of Riparian Buffers in the Upper Deschutes Subbasin*, will apply riparian buffers to remove sediment and nutrients, stabilize stream banks, improve fish habitat, provide food sources, nesting cover and shelter for fish and wildlife in riparian ecosystem habitat in the Upper Deschutes Basin.
- Project Number 25074, *Deschutes Water Exchange*, will develop an active water market in the Deschutes Basin to reallocate water cost effectively from out-of-stream to instream use in order to improve stream flows and water quality.
- Project Number 25075, *Monitoring and Evaluation of Buck Hollow Hydrology*, will monitor and evaluate the hydrologic function of Buck Hollow Creek after the application of conservation management systems designed to reduce peak flows and increase low summer flows.
- Project Number 25083, *Special Status Wildlife Species Surveys and Priority Habitat Assessment in the Deschutes River Subbasin*, will establish permanent sampling stations and transects for target species, conduct species surveys, and assess habitat for maintaining species viability through time.
- Project Number 25088a, *Deschutes River Stray Steelhead Study*, will examine the magnitude and effect of hatchery stray steelhead spawning naturally in tributaries of the Deschutes River.

Table 11 – Projects recommended for funding in the Deschutes River Subbasin.

ProjectID	Title	Sponsor
198805306	Hood River Production Program	PGE
199404200	Trout Creek Habitat Restoration	ODFW
199802800	Trout Creek Watershed Improvement Project	JCSWCD
25005	Bighorn Sheep Reintroduction to the Warm Springs Reservation	CTWSRO
25007	Determine Lamprey Species Composition, Larval Distribution and Adult Abundance	CTWSRO
25009	Assess Watershed Health and Coordinate Watershed Councils in Wasco County, Oregon	WSWCD
25014	Establish Riparian Buffer Systems	WSWCD
25015	Emergency Flow Augmentation for Buck Hollow	WSWCD
25040	Collection of Baseline Measurements of Flow, Temperature, Channel Morphology, Riparian Condition, and Benthic Invertebrates, Trout Creek, Oregon	USGS
25048	Accelerate the Application of Riparian Buffers in the Upper Deschutes Subbasin	WRCD
25074	Deschutes Water Exchange	DRC
25075	Monitoring and Evaluation of Buck Hollow Hydrology	WSWCD
25083	Special Status Wildlife Species Surveys and Priority Habitat Assessment in the Deschutes River Subbasin	ODFW
25088a	Deschutes River Stray Steelhead Study	ODFW

The suite of recommended project proposals addresses the key needs identified in the Deschutes River Summary including:

- Assessment of game and non-game wildlife species presence, abundance, life history, distribution, and habitat utilization to identify areas where habitat improvements or acquisitions might provide benefits to wildlife in the subbasin.
- Assessment of non-native wildlife species abundance, distribution, and effects on native species.
- Assessment of continued and potential reintroduction of native wildlife species that have been extirpated from all or parts of the subbasin, such as California bighorn sheep, mountain goat, pronghorn, sage grouse, and sharp-tailed grouse.
- More active management of lands on which management has been deferred, such as those enrolled in CRP or CREP, to provide increased benefits to wildlife throughout the subbasin.
- Increased law enforcement presence throughout the subbasin to ensure compliance with laws pertaining to wildlife.
- Monitoring and enforcement of federal, state, county and other applicable land use regulations to ensure protection of critical wildlife habitats and habitat functions.
- Continued or expanded studies of life history, genetics, habitat needs, distribution, abundance, and limiting factors for juvenile and adult anadromous salmonid populations in the subbasin, including spawning ground counts and smolt monitoring programs.
- Comprehensive studies of life history, genetics, habitat needs, distribution, abundance exploitation rates, and limiting factors for Pacific lamprey in the subbasin.
- Comprehensive studies of life history, genetics, habitat needs, distribution, and abundance of native game and non-game fish species throughout the subbasin.
- Comprehensive studies of out-of-basin hatchery summer steelhead straying into the Deschutes River and analysis of need for measures to heighten protection of native summer steelhead populations, including construction of fish weirs near the mouths of tributary creeks to facilitate monitoring and possibly removal of hatchery fish from the spawning population.
- Continued or expanded studies of bull trout life history, population status and interactions with brook trout throughout the subbasin to ensure adequacy of bull trout recovery plan goals.
- Comprehensive stream surveys and riparian vegetation surveys to determine current physical and biological characteristics of the streams and riparian areas throughout the subbasin.
- Maintenance of stream habitat enhancement measures installed to date to protect the already substantial investments in the subbasin.
- Maintenance and expansion of riparian fencing projects to protect riparian vegetation and stream bank integrity throughout the subbasin.
- Development of off-stream livestock watering sites, such as solar pump stations and spring developments, to eliminate water gaps and livestock intrusion onto riparian areas throughout the subbasin.

- Restoration of instream and riparian habitat structure, function and diversity through placement of instream habitat structure and stream bank stabilization treatments.
- Removal of U.S. Army Corp of Engineers gravel berms, particularly in the Trout Creek system.
- Restoration of stream channels, where needed throughout the subbasin, through bioengineering techniques (i.e. Rosgen treatments) to reestablish floodplain connectivity and historic stream channel characteristics, and remove a significant sediment source from eroding stream banks.
- Restoration of riparian vegetative corridors through riparian buffer systems and plantings of native shrubs and trees.
- Placement of large woody debris in streams in forested portions of the subbasin to provide much needed fish rearing habitat complexity.
- Placement of spawning gravel in areas lacking sufficient quantities.
- Monitoring and evaluation associated with instream and riparian habitat work, including but not limited to: documentation of effectiveness of instream structure in promoting pool development and habitat complexity; establishment of permanent sites for monitoring changes in channel geometry, slope, and gravel deposition; tracking of downstream and lateral movement of wood and rock structures after flood events; monitoring substrate composition; monitoring fish usage associated with instream structures and riparian improvements.
- Establish conservation easements on private lands in priority streamside and upland areas.
- Assessment of land acquisition opportunities adjacent to priority streams and wetlands throughout the subbasin.
- Inventory fish passage barriers and improve fish passage where impeded by artificial barriers, such as hydroelectric projects, diversion dams, culverts, and other structures, throughout the subbasin.
- Installation of infiltration galleries to eliminate irrigation diversions and push-up dams. This would include associated rehabilitation of abandoned diversion structures and push-up dam berms.
- Screening of all irrigation and other diversions on all fish bearing streams in the subbasin.
- Monitoring and evaluation associated with fish passage and screening projects, including but not limited to: pre- and post-project fish salvage data collection; post-project hydraulic and biological testing; periodic physical and/or hydraulic inspection to insure proper operation; spawning ground surveys above improvements to assess habitat utilization; and other methods as appropriate.
- Continued and expanded water quality and quantity monitoring throughout the subbasin.
- Monitoring and enforcement of instream flows and consumptive water rights throughout the subbasin, including inventory of location and condition of all diversions.
- Restoration of stream flows through water conservation measures, such as improved diversion measurement systems, water use efficiency, and conveyance efficiency.

- Continued or expanded leasing, buying or banking of water rights with willing water right holders.
- Reduction of sediment input from uplands and roading through road closures, obliteration, and other treatments, and increased implementation of practices designed to reduce soil erosion on forest and agricultural lands.
- Reduction of effects of storm water input by managing it in a manner protective of surface and groundwater quality.
- Reduction of waste-water input by ensuring that municipal sewerage facilities are operated in a manner protective of water quality and on-site sewage disposal systems are installed in accordance with DEQ standards.
- Reduction of input of non-point source pollutants through modification of irrigation water return regimes and confined animal feeding operations.
- Assessment of wetland locations and status throughout the subbasin.
- Restoration and increased protection of floodplain areas, especially wetlands.
- Funding for technical assistance for completion of watershed assessments and action plans.
- Funding for technical assistance to landowners for development of land use and farm plans, and conversion from conventional tillage operations to sustainable direct seed/no till systems.

John Day River Subbasin

Thirteen existing projects have been recommended for continued funding in the John Day River Subbasin (Table 12).

- Project Number 198402100, *Protect and Enhance Anadromous Habitat in the John Day Subbasin*, will continue to develop and implement riparian fencing and instream structure projects to protect, enhance and restore riparian and instream habitat to improve anadromous salmonid production.
- Project Number 199306600 *Oregon Fish Screening Project*, will protect wild anadromous and resident fish species by installing 20 replacement fish screening devices in irrigation diversion located in critical spawning and rearing areas in the John Day basin and 1 unscreened and 5 replacements in the Walla Walla.
- Project Number 199405400, *Population Structure of Bull Trout in the Columbia Plateau*, will continue to study bull trout distribution, movements, and abundance throughout the Columbia Plateau Province.
- Project Number 199703400, *Monitoring Fine Sediment Grande Ronde and John Day River*, will continue to monitor surface fine sediment and overwinter sedimentation in cleaned gravel in spring chinook spawning habitats in monitored river reaches, analyze potential trends and relationships in data, and relate to salmon survival.
- Project Number 199801600, *Monitor Natural Escapement and Productivity of John Day Basin Spring Chinook*, will monitor natural escapement and productivity of John Day River Basin spring chinook and summer steelhead and estimate SAR, egg-to-smolt survival, smolt abundance, and adult and parr distribution for chinook and SAR and spawner escapement for steelhead.

- Project Number 199801700, *Eliminate Gravel Push-up Dams in Lower North Fork John Day*, will continue to eliminate gravel push-up dams in the lower North Fork John Day River. Replace with permanent pumping stations resulting in removal of passage impediments and elimination of annual instream modification.
- Project Number 199801800, *John Day Watershed Restoration*, will continue to implement protection and restoration actions to improve water quality, water quantity, and fish habitat, eliminate passage barriers for anadromous and resident fish.
- Project Number 199802200, *Pine Creek Ranch*, will continue construction & implementation, operations & maintenance, monitoring and evaluation for Pine Creek Ranch.
- Project Number 199901000, *Mitigate Effects of Runoff and Erosion on Salmonid Habitat in Pine Hollow and Jack Knife*, will continue to implement practices to reduce erosion and flooding, allowing natural recovery of riparian vegetation and channel type in Pine Hollow and Jackknife Canyons. Future phases will focus on replanting or protecting critical areas in the stream corridor.
- Project Number 199908800, *Columbia Plateau Water Right Acquisition Program*, will continue to acquire existing water rights on a voluntary basis through purchase, gift and water conservation projects, and transfer to instream water rights under Oregon state law; target acquisitions to maximize fulfillment of habitat objectives for instream flows.
- Project Number 200001500, *Oxbow Ranch Management and Implementation*, will continue to implement protection and restoration actions to improve water quality, water quantity, and fish habitat for anadromous and resident fish; monitor effectiveness of implementation actions.
- Project Number 200003100, *North Fork John Day River Subbasin Anadromous Fish Habitat Enhancement Project*, will continue to Protect and restore habitat critical to the recovery of wild salmonid populations in the North Fork John Day River Basin and promoting natural ecological function and improved water quality and quantities.
- Project Number 200005200, *Upstream Migration of Pacific Lampreys in the John Day River: Behavior, Timing, and Habitat Preferences*, will determine behavior (timing and movement patterns) of upstream migrating Pacific lampreys in the John Day River Basin. Overwintering and spawning habitats of Pacific lampreys in the John Day River Basin will be characterized.

Twelve new project proposals have been recommended for funding in the John Day River Subbasin (Table 12).

- Project Number 25006, *Provide Coordination and Technical Assistance to Watershed Councils and individual in Sherman County, Oregon*, will provide support to five watershed councils in Sherman County. All future conservation projects will be based on watershed plans and individual ranch plans developed by these positions.
- Project Number 25028, *John Day Upland Restoration*, will expand restoration program to encompass uplands. Project Number 25050, *Provide Incentives to Convert to Direct Seed/No-till Farming in Sherman County, Oregon*, will provide incentive for two of three crop years for farmers to convert to no-till/direct seed farming. No-till provides improvement in watershed hydrology & sedimentation.

- Project Number 25051, *Columbia Plateau Natural Resources Collaborative*, will establish collaborative process to provide assistance to local watershed groups on subbasin planning, ESA/CWA integration, and implementation funding to facilitate conservation application to restore salmon and water quality on private lands.
- Project Number 25067, *Manage Water Distribution in the John Day Basin*, will implement needed water measurement and monitoring improvements and increase water management as flow restoration projects and actions are implemented in the John Day Basin. Project Number 25069, *John Day Salmonid Recovery Monitoring Program*, will update salmonid reproduction goals, compile data to develop predictive models to guide future restoration efforts, compile data that presents historical riparian condition, investigate missing bull trout status information.
- Project Number 25073, *Wheeler SWCD Riparian Buffer Planning and Implementation*, will implement a riparian buffer program using cost share funding from USDA, State of Oregon and private landowners.
- Project Number 25080, *Gilliam SWCD Riparian Buffers*, will plan and implement riparian buffer program using USDA, Oregon and private landowner costshare. Project Number 25084, *Develop GIS Layers for Generation of Specific Natural Resource GIS Maps and Analysis*, will develop data sets for use in comparative analysis of multiple factors affecting fish and wildlife values in the four subbasins. This data can help inyegrate basin wide natural resource planning and decision making.
- Project Number 25085, *Eradication of Brook Trout from Winom Creek to Enhance Bull Trout Habitat*, will remove brook trout from Winom Creek above a natural barrier to reduce hybidization and competition with a resident bull trout population and increase available bull trout habitat.
- Project Number 25088b, *Priority Area Designation for At-risk Fishes in the Oregon Portion of the Columbia Plateau*, will implement fish population and habitat monitoring (EMAP), steelhead life history monitoring, habitat prioritization, and fish/wildlife/habitat protection in the Oregon portion of the Columbia Plateau.
- Project Number 25088c, *Enhance Fish and Wildlife Enforcement in the Columbia Plateau*, will enhance and protect Columbia River salmonids and other depleted fish stocks through increased law enforcement effectiveness in the mainstem Columbia River, and its tributaries within the Oregon portion of the Columbia Plateau.
- Project 25010, *Regional Stream Conditions and Stressor Evaluation*, will evaluate status and trends of key factors limiting listed species within subbasins by developing a statistically based model to characterize baseline conditions and identify conditions at regional reference sites.

Table 12. Projects recommended for funding in the John Day River Subbasin

ProjectID	Title	Sponsor
198402100	Protect and Enhance Anadromous Habitat in the John Day Subbasin	ODFW
199306600	Oregon Fish Screening Project	ODFW
199405400	Population Structure of Bull Trout in the Columbia Plateau	ODFW,CTWSRO
199703400	Monitoring Fine Sediment Grande Ronde and John Day River	CRITFC
199801600	Monitor Natural Escapement and Productivity of John Day Basin Spring Chinook,	ODFW
199801700	Eliminate Gravel Push-up Dams in Lower North Fork John Day	NFJDWC

ProjectID	Title	Sponsor
199801800	John Day Watershed Restoration	CTWSRO
199802200	Pine Creek Ranch	CTWSRO
199901000	Mitigate Effects of Runoff and Erosion on Salmonid Habitat in Pine Hollow and Jack Knife	SSWCD
199908800	Columbia Plateau Water Right Acquisition Program	OWT
200001500	Oxbow Ranch Management and Implementation	CTWSRO
200003100	North Fork John Day River Subbasin Anadromous Fish Habitat Enhancement Project	CTUIR
200005200	Upstream Migration of Pacific Lampreys in the John Day River: Behavior, Timing, and Habitat Preferences	USGS
25003	Forrest Ranch Acquisition	CTWSRO
25004	Acquisition of Wagner Ranch	CTWSRO
25006	Provide Coordination and Technical Assistance to Watershed Councils and individual in Sherman County, Oregon	SSWCD
25028	John Day Upland Restoration	CTWSRO
25050	Provide Incentives to Convert to Direct Seed/No-till Farming in Sherman County, Oregon	SSWCD
25051	Columbia Plateau Natural Resources Collaborative	NRCS
25067	Manage Water Distribution in the John Day Basin	OWRD
25069	John Day Salmonid Recovery Monitoring Program	CTWSRO
25073	Wheeler SWCD Riparian Buffer Planning and Implementation	WSWCD
25080	Gilliam SWCD Riparian Buffers	GSWCD
25084	Develop GIS Layers for Generation of Specific Natural Resource GIS Maps and Analysis	ODFW
25085	Eradication of Brook Trout from Winom Creek to Enhance Bull Trout Habitat,	USFS
25086	Purchase Perpetual Conservation Easement on Holliday Ranch and Crown Ranch Riparian Corridors and Uplands	ODFW
25088b	Priority Area Designation for At-risk Fishes in the Oregon Portion of the Columbia Plateau	ODFW
25088c	Enhance Fish and Wildlife Enforcement in the Columbia Plateau	ODFW
25010	Regional Stream Conditions and Stressor Evaluation	ODEQ

Three new project proposals were identified that could potentially be implemented as "High Priority" pending crediting resolution with BPA and NWPPC (Table 13).

- Project Number 25003, *Forrest Ranch Acquisition*, will acquire approximately 4,295 acres of land, 12.2 miles of streams, 25.2 cfs of senior water rights, and structures on the Middle Fork and upper mainstem John Day Rivers known as the Forrest Ranch.
- Project Number 25004, *Acquisition of Wagner Ranch*, will acquire Wagner Ranch to provide a contiguous corridor of fish and wildlife habitat along the lower John Day River.
- Project Number 25086, *Purchase Perpetual Conservation Easement on Holliday Ranch and Crown Ranch Riparian Corridors and Uplands*, will fence 17.7 miles of mainstem John Day River and tributaries, and protect 15,532 acres of uplands two miles east of John Day, Oregon under perpetual conservation easement to improve habitat and protect steelhead spawning grounds and big game winter range.

Table 13. Projects that could potentially be implemented as "High Priority" in the John Day River Subbasin pending crediting resolution with BPA and NWPP.

ProjectID	Title	Sponsor
25003	Forrest Ranch Acquisition	CTWSRO

ProjectID	Title	Sponsor
25004	Acquisition of Wagner Ranch	CTWSRO
25086	Purchase Perpetual Conservation Easement on Holliday Ranch and Crown Ranch Riparian Corridors and Uplands	ODFW

The suite of recommended project proposals addresses the key needs identified in the John Day River Summary including:

- Restore and protect riparian habitat and structure, channel function and form, flows, and water quality for primarily bull trout, spring chinook salmon and summer steelhead; habitat and water quality improvements needed for other resident trout species as well.
- Restore, protect, and create riparian, wetland, and floodplain areas within the subbasin and establish connectivity; need to especially restore floodplains in areas degraded by dredge mining.
- Restore in-stream habitat to natural conditions and protect as much as possible to provide suitable holding, spawning, and rearing areas for anadromous and resident fish.
- Ensure adequate controls are placed on mining, grazing, logging, and pollution to protect riparian and instream habitat.
- Inventory and eliminate passage barriers within the basin to facilitate movement of adult and juvenile salmonids, create suitable flow conditions, and restore inundated habitat.
- Appropriately screen all irrigation diversions in the subbasin to prevent fish loss and replace outdated screens that may cause fish loss.
- Protect and restore aspen and cottonwood sites where they currently exist in riparian areas to restore roosting habitat for wintering bald eagles and great blue herons.
- Maintain, enhance, and protect big game winter range and critical upland habitats.
- Acquire lands when opportunities arise for improved habitat protection, restoration, and connectivity and for mitigation of lost wildlife habitat (land purchases, land trusts, conservation easements, landowner cooperative agreements, exchanges).
- Continue control programs for noxious weeds to restore natural habitat conditions and communities for wildlife species.
- Reduce road densities and their associated impacts to watershed functions (changes in hydrograph, increased sediment, and increased water temperature).
- Support planned road closures on public land and encourage closure of other roads.
- Restore and augment streamflows at critical times; examples include (but not limited to) Water Right Instream Leases and Transfers, water rights purchases, improved irrigation efficiency).
- Reduce stream temperatures.
- Additional gauging stations in John Day Subbasin to monitor improvement in flows and temperatures as habitat improvement projects are completed.
- Upgrade existing gauging stations to improve access to real-time streamflow and water temperature data.

- Increase the number of tools associated with irrigation water management, including headgates and flow measuring devices on both private and public lands.
- Assist landowners with land holdings and easements.
- Monitor water quantity and water quality improvements.
- Improve monitoring and enforcement of consumptive water rights throughout the basin and determine water availability.
- Conduct a thorough inventory of water diversion locations and condition throughout the subbasin and need the equipment to do so.
- Evaluate habitat improvement needs and approaches in critical drainages to improve passage for spring chinook salmon and summer steelhead.
- Evaluate new screen designs (and obtain NMFS approval on designs) for incorporation into diversion systems where appropriate.
- Revalidate spawning information using improved technology (GIS) and subsequently reassess escapement goals, spawner/recruitment goals based on improved spawning ground data.
- Determine smolt-to-adult survival, survival factors, spawning escapement, and life history characteristics.
- Calculate returns per spawner from index surveys to determine if this relationship is improving as smolt passage facilities are modified at Columbia River dams.
- Monitor spring chinook by examining population trends and develop modeling and monitoring "tools" to determine out-of-basin impacts to John Day River spring chinook.
- Monitor migration patterns to determine passage barriers within the basin for adult spring chinook salmon.
- Determine the number of adults and smolts needed to fully seed current and future (post improvements) spring chinook habitat.
- Determine life history and movement patterns of spring chinook salmon within the John Day Subbasin, including assessment of adult holding areas, juvenile rearing areas, and juvenile migration patterns.
- Collect life history and distribution information on known bull trout populations within the Middle Fork and North Fork John Day rivers, including seasonal use patterns and associated habitat parameters.
- Determine degree of interchange between bull trout populations in Middle Fork tributaries and between the Middle Fork and North Fork rivers.
- Estimate abundance and monitor known populations to establish trends and measure population response to restoration.
- Determine the extent and magnitude of nonnative species interaction and hybridization to better define treatment options.
- Continue presence/absence surveys to locate remnant bull trout populations.
- Analysis of potential for reintroduction of bull trout populations into historic habitat (Middle Fork).
- Collect life history, distribution, and homing behavior information on Pacific lamprey within the John Day Subbasin.
- Estimate adult migrant abundance and juvenile abundance in John Day River watersheds.

- Determine habitat requirements and limiting factors for lamprey production in the John Day Subbasin.
- Assess the rehabilitation potential of and process for Pacific lamprey in the subbasin.
- Improve enforcement of laws and codes related to protection of fish and wildlife and their habitats, including increased efforts for in and out-of-season poaching and in road closure areas.
- Improve enforcement of road closures.

Mainstem Lower Snake River Subbasin

Two existing projects have been recommended for continued funding in the Mainstem Lower Snake River Subbasin (Table 14).

- Project Number 199102900, *Understanding the Effects of Summer Flow Augmentation on the Migratory Behavior and Survival of Fall Chinook Salmon Migrating through Lower Granite Reservoir,* will increase the potential for fall chinook salmon recovery by providing data and analyses for implementing, evaluating, and understanding the mechanisms of summer flow augmentation.
- Project Number 199401807, *Garfield County Sediment Reduction and Riparian Improvement Program,* will coordinate, implement, and monitor conservation practices for the reduction of sediment from the uplands of Garfield County and enhance habitat in the riparian zones of the streams to improve water quality for Steelhead and Chinook Salmon.

Four new project proposals have been recommended for funding in the Lower Snake River Subbasin (Table 14).

- Project Number 25033, *Evaluate Restoration Potential of Mainstem Habitat for Anadromous Salmonids in the Columbia and Snake River,* will identify mainstem habitat sampling reaches, collect baseline data on physical habitat conditions, identify opportunities for mimicking the range and diversity of historic habitat conditions, develop improvement recommendations for mainstem reaches.
- Project Number 25049, *Numerically Simulating the Hydrodynamic and Water Quality Environment for Migrating Salmon in the Lower Snake River,* will apply state-of-the-art computer models that can describe the complex hydrodynamic and water quality environment in the lower Snake River, and to relate that information to migrating salmon.
- Project Number 25053, *Evaluate Bull Trout Movements in the Tucannon and Lower Snake Rivers,* will determine spatial and temporal distribution of migratory bull trout in the Tucannon River and Lower Snake River. Estimate "take" and identify passage limitations in the Snake River resulting from the hydropower system.
- Project Number 25064, *Investigating Passage of ESA-listed Juvenile Fall Chinook Salmon at Lower Granite Dam during Winter when the Fish Bypass Systems is Inoperable,* will describe passage timing, genetic lineage, scale patterns, and locations of fall chinook salmon that hold over in Lower Granite Reservoir during the winter.

Table 14. Projects recommended for funding in the Lower Snake River Subbasin.

ProjectID	Title	Sponsor
199102900	Understanding the Effects of Summer Flow Augmentation on the Migratory Behavior and Survival of Fall Chinook Salmon Migrating through Lower Granite Reservoir	USFWS, USGS
199401807	Garfield County Sediment Reduction and Riparian Improvement Program,	PCD
25033	Evaluate Restoration Potential of Mainstem Habitat for Anadromous Salmonids in the Columbia and Snake River	PNNL
25049	Numerically Simulating the Hydrodynamic and Water Quality Environment for Migrating Salmon in the Lower Snake River	PNNL
25053	Evaluate Bull Trout Movements in the Tucannon and Lower Snake Rivers	USFWS
25064	Investigating Passage of ESA-listed Juvenile Fall Chinook Salmon at Lower Granite Dam during Winter when the Fish Bypass Systems is Inoperable	USFWS, USGS

This suite of recommended proposals addresses the key needs identified in the Lower Snake River Summary including:

- Determine the upstream and downstream passage requirements of bull trout at the Lower Snake River dams.
- Determine the presence of, and use by, bull trout in the mainstem Snake River, and implement monitoring and studies to provide critical information on bull trout distribution, timing, and usage of the lower Snake River dams and reservoir system.
- Determine the relation between flow and water temperature in the lower Snake River reservoirs and passage survival of juvenile anadromous salmonid smolts. These investigations should address the effects of flow augmentation and spill.
- Determine the presence of anadromous salmonid juveniles during winter in the lower Snake River reservoirs, and implement monitoring and studies to provide critical information on passage timing of these juveniles at the lower Snake River dams.
- Determine the smolt-to-adult return rates for wild fall chinook salmon that are collected at the lower Snake River dams and then trucked to the Columbia River estuary.
- Increase understanding of riverine ecosystem processes in large rivers, as applied to the Lower Snake River.
- Develop a greater understanding of the riverine habitat potential in the tailraces of mainstem dams under various hydrosystem operational scenarios.
- Apply the concepts and empirical relationships developed under the Hanford Reach fall chinook conceptual spawning habitat model to reaches in the Lower Snake River, in order to improve estimates of production potential and identify reaches with greatest restoration potential.
- Restore riparian habitat along perennial and ephemeral streams.
- Reduce sedimentation entering perennial streams.
- Soil conservation measures should be integrated into upland cultivation practices to reduce sedimentation of the stream channel.
- Re-establishment of a healthy riparian vegetative community would also help stabilize streambanks presently eroding or prone to future erosion.
- Restore riparian habitat along critical area of Deadman Creek
- Reduce sedimentation entering Deadman Creek

Tucannon River Subbasin

Two existing projects have been recommended for continued funding in the Tucannon River Subbasin (Table 15).

- Project Number 199401806, *Implement Tucannon River Model Watershed Plan to Restore Salmonid Habitat*, will continue to implement, assess, and monitor habitat cost-share projects coordinated through the Tucannon River Model Watershed Program, a "grass roots" public and agency collaborated effort to restore salmonid habitat on private and public property.
- Project Number 200001900, *Tucannon River Spring Chinook Captive Broostock Program*, will continue to conduct the Tucannon River spring chinook captive broodstock program including the rearing and spawning of broodstock, raising their progeny and releasing up to an additional 150,000 smolts into the Tucannon River to rebuild their run and prevent extinction

Two new project proposals have been recommended for funding in the Tucannon River Subbasin (Table 15).

- Project Number 25019, *Tucannon River Roads, Cut and Fill Slope Restoration*, will stabilize road cut and fill slopes with erosion matting, and boulder collars reducing sediment contributions to the Tucannon River and its tributaries.
- Project Number 25072, *Restore Tucannon River Riparian Habitat: Wooten Wildlife Area*, will remove six (6) campgrounds from within Tucannon River riparian zone; restore riparian habitat and function through revegetation and protection to improve anadromous fish habitat; establish three (3) new campgrounds outside riparian zone.

Table 15. Projects recommended for funding in the Tucannon River Subbasin.

ProjectID	Title	Sponsor
199401806	Implement Tucannon River Model Watershed Plan to Restore Salmonid Habitat	CCD
200001900	Tucannon River Spring Chinook Captive Broostock Program	WDFW
25019	Tucannon River Roads, Cut and Fill Slope Restoration	USFS
25072	Restore Tucannon River Riparian Habitat: Wooten Wildlife Area	WDFW

The suite of recommended project proposals addresses the key needs identified in the Tucannon River Summary including:

- Improve or re-establish well developed, mature riparian buffers, increased channel stability and sinuosity, and floodplain connectivity throughout the subbasin.
- Decreased water temperatures and sediment delivery to the Tucannon River.
- Improve instream fish habitat quality and quantity.
- Improve fluvial geomorphic conditions for attainment of self-sustainable fish populations and reduction of sediment delivery due to streambank erosion.
- Reduce water temperatures.
- Reduce upland erosion and sedimentation delivery rates to decrease the percentage of fines in spawning gravels.

- The Tucannon River Model Watershed Plan to restoration, maintenance, or enhancement activities for spawning and rearing habitat within the subbasin.
- Determine the level of stray non-endemic salmon and steelhead that enter the Tucannon River and recommend actions to mitigate their effect.
- Determine whether captive brood Tucannon spring chinook can be used effectively to reestablish extirpated populations in Asotin Creek and potentially in the Walla Walla River.
- Increase native stock steelhead and spring chinook to sustainable levels
- Increase wild steelhead and spring chinook to sustainable levels
- Enhance riparian vegetative diversity and abundance to increase habitat available for wildlife and promote natural stream channel development and stability.
- Improve road closure programs on National Forest.
- Reduce OHV use on National Forest lands.

Walla Walla River Subbasin

Seven existing projects have been recommended for continued funding in the Walla Walla River Subbasin (Table 16).

- Project Number 199601100, *Walla Walla River Juvenile and Adult Passage Improvements*, will provide safe passage for migrating juvenile and adult salmonids in the Walla Walla Basin by constructing and maintaining passage facilities at irrigation diversion dams and canals.
- Project Number 199604601, *Walla Walla Basin Fish Habitat Enhancement*, will protect and restore habitat critical to the recovery of weak or reintroduced populations of salmonid fish in the Walla Walla Basin thereby promoting natural ecological function and improved water quality and quantity.
- Project Number 199802000, *Assess Fish Habitat and Salmonids in the Walla Walla Watershed in Washington*, will continue to design and construct of adult traps in Mill Creek and the Touchet River, and steelhead and bull trout monitoring activities in those drainages and in the lower Walla Walla River.
- Project Number 200002600, *Rainwater Wildlife Area*, will protect, enhance, and mitigate wildlife habitat impacted by McNary and John Day hydroelectric projects. Project includes O&M to protect existing habitat values, enhancements to increase habitat quantity and quality, and M&E to assess project benefits.
- Project Number 200003800, *Design and Construct NEOH Walla Walla Hatchery*, will add incubation/juvenile rearing capabilities to the existing South Fork Walla Walla adult holding/spawning facility to produce spring chinook salmon and aclimate summer steelhead for release in the Walla Walla River Basin.
- Project Number 200003900, *Walla Walla Basin Natural Production and Monitoring Evaluation Project*, will monitor and evaluate natural spawning, rearing, migration, survival, age and growth characteristics and life histories of adult salmon, steelhead, bull trout and mountain whitefish, and their naturally produced progeny in the Walla Walla River Basin.

- Project Number 200020139, *Walla Walla River Fish Passage Operations*, will increase survival of migrating juvenile and adult salmonids in the Walla Walla Basin by operating passage facilities, flow enhancement measures, trapping facilities, and transport equipment to provide adequate passage conditions.

Five new project proposals have been recommended for funding in the Walla Walla River Subbasin (Table 16).

- Project Number 25017, *Fabricate and Install New Huntsville Mill Fish Screen*, will fabricate and install a new fish screen facility (12 cfs) at the existing Huntsville Mill location within the Touchet River Basin. The new screen facility will comply with current state and federal criteria for fish protection.
- Project Number 25065, *Forward Looking Infrared Radiometry (FLIR) Thermal Imagery and Analysis of Tucannon River, Touchet River, and Mill Creek (FY2000) with follow-on 2003-04*, will obtain thermal imagery, imagery analysis, and supporting instream data, to map areas of thermal refugia and areas of heating in order to assess habitat condition and to provide data for restoration efforts, particularly Total Maximum Daily Loads (TMDLs).
- Project Number 25066, *Manage Water Distribution in the Walla Walla River Basin*, will implement needed water measurement and monitoring improvements and increase water management as flow restoration projects and actions are implemented in the Walla Walla Basin.
- Project Number 25082, *Walla Walla River Flow Restoration*, will add 5 to 7 cfs of conserved irrigation water to the Walla Walla River at the critical flow-impaired reach between the town of Milton-Freewater and the Oregon-Washington state line.
- Project Number 25094, *Restore Touchet River Watershed Habitat to Support ESA-listed Stocks*, will implement, assess, and monitor habitat cost-share projects coordinated through the Touchet River Watershed Program, a "grass roots" public and agency collaborated effort to restore salmonid habitat on private and public property.

Table 16 – Projects recommended for funding in the Walla Walla River Subbasin.

ProjectID	Title	Sponsor
199601100	Walla Walla River Juvenile and Adult Passage Improvements	CTUIR
199604601	Walla Walla Basin Fish Habitat Enhancement	CTUIR
199802000	Assess Fish Habitat and Salmonids in the Walla Walla Watershed in Washington	WDFW
200002600	Rainwater Wildlife Area	CTUIR
200003800	Design and Construct NEOH Walla Walla Hatchery	CTUIR
200003900	Walla Walla Basin Natural Production and Monitoring Evaluation Project	CTUIR
200020139	Walla Walla River Fish Passage Operations	CTUIR
25017	Fabricate and Install New Huntsville Mill Fish Screen	WDFW
25065	Forward Looking Infrared Radiometry (FLIR) Thermal Imagery and Analysis of Tucannon River, Touchet River, and Mill Creek (FY2000) with follow-on 2003-04	WDEQ
25066	Manage Water Distribution in the Walla Walla River Basin	OWRD
25082	Walla Walla River Flow Restoration	WWBWD
25094	Restore Touchet River Watershed Habitat to Support ESA-listed Stocks	CCD

The suite of recommended project proposals addresses the key needs identified in the Walla Walla River Summary including:

- Document primary and secondary steelhead spawning areas.
- Evaluate juvenile salmonid outmigrant timing and survival. Identify and document problem reaches and factors.
- Evaluate success of out-planting spring chinook adult into spawning and rearing areas, monitor resulting progeny at the parr, smolt and adult life-history stages.
- Collect trend data for salmonid distribution, abundance, densities, and aging growth throughout the subbasin.
- Increase spawner surveys to detect movements and reproductive isolation and distribution.
- Assess the level of residualism from hatchery-reared steelhead from the subbasin.
- Assess the in-basin level of straying and spawning into natural steelhead production areas by non-endemic hatchery steelhead.
- Reconstruct/improve Touchet River trap in Dayton.
- Evaluate straying of reintroduced Walla Walla spring chinook into the Tucannon River.
- Determine passage success of adult steelhead and bull trout past irrigation diversions and other passage obstacles.
- Evaluate results of existing flow enhancement efforts and define most feasible options to meet additional needs.
- Protect, maintain, and enhance shrubsteppe habitats.
- Improve connectivity between existing shrubsteppe fragments.
- Move savannah grassland with potential brooding, leking and wintering sharp-tailed grouse habitat into protect status.
- Enhance and restore native perennial grassland habitats.
- Reduce non-native annual grasses in shrubsteppe and grassland habitat.
- Pursue and implement effective biological controls on noxious weeds including yellow-star thistle and knapweeds.
- Protect, maintain, and enhance late-seral dry forest habitats.
- Maintain large patch size late-seral dry forest stands.
- Restore and maintain snag and downed wood densities of a variety of species to meet nesting and foraging requirements of forest dwelling landbirds.
- Move mid-elevation and foothill big game winter range habitat into protected status
- Protect, enhance, and restore aspen clones.
- Reduce road densities and associated impacts to watershed functions.
- Control noxious weeds in specific high value habitat areas (i.e. reed canary grass in wetland and riparian communities).
- Restore riparian understory shrub communities.
- Maintain and improve large structure riparian cottonwood galleries for Lewis' woodpecker.
- Identify and protect remaining ferruginous hawk nest sites and associated habitats in the subbasin.
- Restore anadromous fish populations to support dependent wildlife populations and promote natural nutrient cycling.

- Evaluate status of avian species that are inadequately surveyed by standardized survey protocols.
- Evaluate the importance of individual habitat fragments to native wildlife species on private lands in the subbasin.
- Maintain, protect, and enhance big game winter range.
- Reintroduce Rocky Mountain bighorn sheep into suitable habitats.
- Reestablish harvestable populations of mountain quail.

Umatilla River Subbasin

Thirteen existing projects have been recommended for continued funding in the Walla Umatilla River Subbasin (Table 17).

- Project Number 198343500, *Operate and Maintain Umatilla Hatchery Satellite Facilities*, will acclimate juvenile salmon and steelhead prior to release in the Umatilla Basin.
- Project Number 198343600, *Umatilla Basin Fish Facilities Operations and Maintenance*, will provide Operations and Maintenance services of fish passage and satellite facilities in the Umatilla Basin.
- Project Number 198710001, *Enhance Umatilla River Basin Anadromous Fish Habitat*, will enhance floodplain, riparian and in-stream habitat on private lands in the Umatilla River Basin to increase natural production of summer steelhead, coho salmon and chinook salmon.
- Project Number 198710002, *Umatilla Subbasin Fish Habitat Improvement*, will protect and enhance cold water fish habitat on private lands in the Umatilla River basin in a manner that achieves self-sustaining salmonid populations and their associated habitat by utilizing natural stream functions to the fullest extent.
- Project Number 198802200, *Umatilla River Fish Passage Operations*, will increase survival of migrating juvenile and adult salmon and steelhead in the Umatilla Basin by operating passage facilities, flow enhancement measures, trapping facilities, and transport equipment to provide adequate passage conditions.
- Project Number 198805302, *Design and Construct Umatilla Hatchery Supplement*, will build incubation/juvenile rearing capabilities at the existing South Fork Walla Walla spring chinook adult holding and spawning facility to rear spring chinook for acclimation/release in the Umatilla Basin.
- Project Number 198902401, *Evaluate Juvenile Salmonid Outmigration and Survival in the Lower Umatilla River Basin*, will assess migration patterns, abundance, survival of hatchery and natural juvenile salmonids in Umatilla basin using PIT tag technology; monitor lamprey and resident fish; assess affects of river variables on fish migration; develop adult interrogation.
- Project Number 198902700, *Power Repay Umatilla Basin Project*, will provide power or reimbursement of power costs to Bureau of Reclamation for Umatilla Basin Project pumping plants that provide Columbia River water to irrigators in exchange for Umatilla River water left instream.

- Project Number 198903500, *Umatilla Hatchery Operations and Maintenance*, will restore Umatilla River Chinook and steelhead fisheries and populations through release of subyearling and yearling smolts produced at Umatilla Hatchery.
- Project Number 199000500, *Umatilla Fish Hatchery Monitoring and Evaluation*, will Evaluate juvenile rearing, adult survival, stock life history, straying, fish health and sport fishing and catch contribution for salmon and steelhead reared in oxygen supplemented and standard raceways at Umatilla Hatchery.
- Project Number 199000501, *Umatilla Basin Natural Production Monitoring and Evaluation Project*, will Monitor and evaluate natural spawning, rearing, migration, survival, age and growth characteristics and life histories of adult salmon, steelhead, bull trout and mountain whitefish, and their naturally produced progeny in the Umatilla River Basin.
- Project Number 199402600, *Pacific Lamprey Research and Restoration*, will implement and monitor Pacific lamprey restoration plan developed for the Umatilla River. Project Number 199506001, *Protect and Enhance Wildlife Habitat in Squaw Creek Watershed*, will protect and enhance watershed resources to provide benefits for eight HEP Target Species and anadromous and resident salmonids.

Nine new project proposals have been recommended for funding in the Umatilla River Subbasin (Table 17).

- Project Number 25016, *Assessment of Habitat Improvement Actions on Water Temperature, Streamflow, Physical Habitat, and Aquatic Community Health in the Birch Creek Watershed*, will explore the reach- and watershed-scale impacts of stream-habitat improvement actions on water temperature, streamflow and the food web in the Birch Creek watershed of the Umabilla subbasin.
- Project Number 25029, *Westland-Ramos Fish Passage and Habitat Restoration Pilot Project*, will improve the upstream passage for anadromous fisheries resources (migration, spawning and rearing), and enhance bedload transport function, by notching two diversion dams within a 1.25-mile river reach of the lower Umatilla River.
- Project Number 25047, *Morrow County Buffer Initiative*, will implement riparian buffer program using cost share provided by USDA, State of Oregon, and private landowners.
- Project Number 25055, *Echo Meadows Artificial Recharge Extended Groundwater and Surface Water Modeling*, will assess impacts of artificial recharge design on stream temperature, effluent chemistry, and pulse duration. This project is designed to establish tools and protocols that can be ported to additional candidate sites.
- Project Number 25059, *Develop Progeny Marker for Salmonids to Evaluate Supplementation*, will develop and evaluate a chemical progeny mark to evaluate natural reproductive success of supplemented steelhead . The mark would be administered to female parents and would be detectable in the otolith of their progeny.
- Project Number 25077, *Umatilla Conservation Buffer Project*, will implement buffer program using cost share provided by Confederated Tribes Umatilla Indian Reservation, USDA, State of Oregon, and private landowners.

- Project Number 25081, *Improve Upstream Fish Passage in the Birch Creek Watershed*, will improve upstream fish passage in the Birch Creek watershed (Umatilla River tributary) for the benefit of summer steelhead and redband trout by removing structures or building fishways over existing irrigation diversion dams.
- Project Number 25093, *Characterize Genetic Differences and Distribution of Freshwater Mussels*, will conduct freshwater mussel surveys to assess their status and test for geographical genetic differences among the western pearlshell mussel, Margaritifera falcata.
- Project Number 195505500, *Umatilla Tribal Fish and Wildlife Enforcement*, will increase law enforcement (LE) protection to fish, wildlife, their critical habitats and other essential natural resources within watersheds managed by CTUIR. The program will be coordinated with all other resource enhancement projects of the tribe.

Table 17. Projects recommended for funding in the Umatilla River Subbasin

ProjectID	Title	Sponsor
198343500	Operate and Maintain Umatilla Hatchery Satellite Facilities	CTUIR
198343600	Umatilla Basin Fish Facilities Operations and Maintenance	WID
198710001	Enhance Umatilla River Basin Anadromous Fish Habitat	CTUIR
198710002	Umatilla Subbasin Fish Habitat Improvement	ODFW
198802200	Umatilla River Fish Passage Operations	CTUIR
198805302	Design and Construct Umatilla Hatchery Supplement	CTUIR
198902401	Evaluate Juvenile Salmonid Outmigration and Survival in the Lower Umatilla River Basin	ODFW
198902700	Power Repay Umatilla Basin Project	BPA
198903500	Umatilla Hatchery Operations and Maintenance	ODFW
199000500	Umatilla Fish Hatchery Monitoring and Evaluation	ODFW
199000501	Umatilla Basin Natural Production Monitoring and Evaluation Project	CTUIR
199402600	Pacific Lamprey Research and Restoration	CTUIR
199506001	Protect and Enhance Wildlife Habitat in Squaw Creek Watershed	CTUIR
200002300	Securing Wildlife Mitigation Sites – Oregon, Horn Butte Area (Philippi Property)	ODFW
200002116	Securing Wildlife Mitigation Sites – Oregon, Horn Butte Area (BAIC Tract)	TNC
25016	Assessment of Habitat Improvement Actions on Water Temperature, Streamflow, Physical Habitat, and Aquatic Community Health in the Birch Creek Watershed	USGS
25029	Westland-Ramos Fish Passage and Habitat Restoration Pilot Project	WID
25047	Morrow County Buffer Initiative	MSWCD
25055	Echo Meadows Artificial Recharge Extended Groundwater and Surface Water Modeling	PNNL
25059	Develop Progeny Marker for Salmonids to Evaluate Supplementation	CTUIR
25077	Umatilla Conservation Buffer Project	USWCD
25081	Improve Upstream Fish Passage in the Birch Creek Watershed	ODFW
25093	Characterize Genetic Differences and Distribution of Freshwater Mussels	CTUIR
195505500	Umatilla Tribal Fish and Wildlife Enforcement	CTUIR

Two existing project proposals were identified that could potentially be implemented as "High Priority" pending crediting resolution with BPA and NWPPC (Table 18).

- Project Number 200002300, *Securing Wildlife Mitigation Sites – Oregon, Horn Butte Area (Philippi Property*), will protect and enhance shrub-steppe and native bunch grass habitat in the Horn Butte area to mitigate for wildlife impacts by the Columbia River Federal hydropower system.

- Project Number 200020116, *Securing Wildlife Mitigation Sites – Oregon, Horn Butte Area (BAIC Tract)*, will protect and enhance the BAIC Tract in the Horn Butte area, which includes 22,642 acres of shrub-steppe and native bunchgrass, to mitigate for wildlife impacts from the Federal Columbia River Hydropower System.

Table 18 – Projects that could potentially be implemented as "High Priority" in the Umatilla River Subbasin pending crediting resolution with BPA and NWPP.

ProjectID	Title	Sponsor
200002300	Securing Wildlife Mitigation Sites – Oregon, Horn Butte Area (Philippi Property)	ODFW
200002116	Securing Wildlife Mitigation Sites – Oregon, Horn Butte Area (BAIC Tract)	TNC

The suite of recommended project proposals addresses the key needs identified in the Umatilla River Summary including:

- Continue collecting trend data for salmonid distribution, abundance, densities, age, and growth throughout the subbasin at established index sites
- Continue collecting trend data for natural adult returns and the natural spawning of hatchery and natural produced steelhead, spring chinook, fall chinook, coho, bull trout and lamprey
- Maintain artificial production monitoring and evaluation programs
- Monitor juvenile salmonid outmigrant timing and survival
- Evaluate existing flow enhancement efforts and define the most feasible options to meet additional needs
- Evaluate salmonid supplementation programs
- Continue research and restoration of Pacific lamprey and develop a research and restoration plan for shellfish
- Monitor distribution and abundance of spawning hatchery-reared steelhead
- Inventory pump diversions and determine screening needs
- Inventory irrigation diversions in the Butter and Willow Creek drainages and determine passage and screening needs
- Evaluate existing flow enhancement efforts and define most feasible options to meet additional needs
- Protect, maintain and enhance shrub steppe habitats
- Improve connectivity between existing shrub steppe fragments
- Move savannah grassland with potential brooding , leking and wintering sharp-tailed grouse habitat into protect status
- Enhance and restore native perennial grassland habitats
- Reduce non-native annual grasses in shrub-steppe and grassland habitat
- Pursue and implement effective biological controls on noxious weeds including yellow-star thistle and knapweeds
- Protect, maintain, and enhance late-seral dry forest habitats
- Maintain large patch size late-seral dry forest stands
- Restore and maintain snag and downed wood densities of a variety of species to meet nesting and foraging requirements of forest dwelling landbirds

- Move mid-elevation and foothill big game winter range habitat into protected status
- Protect, enhance, and restore aspen groves
- Reduce road densities and associated impacts to watershed functions
- Control noxious weeds in specific high value habitat areas (e.g. reed canary grass in wetland and riparian communities)
- Restore riparian understory shrub communities
- Maintain and improve large structure riparian cottonwood galleries for Lewis's woodpeckers
- Identify and protect remaining ferruginous hawk nest sites and associated habitats in the subbasin
- Restore anadromous fish populations to support salmon dependent wildlife and promote natural nutrient cycling
- Evaluate status of avian species that are inadequately surveyed by standardized survey protocols
- Evaluate the importance of individual habitat fragments to native wildlife species on private lands in the subbasin
- Assess methods to reduce cowbird parasitism on native bird species
- Maintain, protect and enhance big game winter range
- Reduce domestic sheep/bighorn sheep conflicts in primary Rocky Mountain bighorn sheep habitat
- Reestablish harvestable populations of mountain quail